CITY OF MANCHESTER.

REPORT

ON THE

Health of the City of Manchester,

1901.

BY

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PUBLIC HEALTH OFFICE,
TOWN HALL, MANCHESTER,
APRIL 22ND, 1902.

MY LORD MAYOR, ALDERMEN, AND MEMBERS
OF THE CITY COUNCIL.

I have the honour to place before you my Annual Report on the Health of the City for the year 1901.

An examination of the Annual Death-rates of the City and of its constituent Sanitary Districts for the ten years 1891–1900, as obtained with the aid of the census figures for population, shows that substantial progress has been made during the decennium.

A study of the Statistics for the year 1901 would lead us to believe that the outbreak of Arsenical Poisoning in 1900 did more harm than was supposed at the time. A considerable drop occurred in the birth-rate, which, on a consideration of all the facts available, would appear to be the result of that occurrence.

Only one case of Smallpox occurred during the year 1901. The recent prevalence of this disease in London and the surrounding towns has raised a considerable amount of apprehension, and I have therefore given some account of the measures which would be taken on the appearance of Smallpox in Manchester.

The value of the isolation in Hospital of cases of Scarlet Fever as a measure of protection to the community has lately been called in question, and I have, therefore, given a careful study to the particulars collected in Manchester which could throw light upon the subject. The analysis of these appears to indicate that a considerable degree of protection is afforded by the Hospital.

Diphtheria has become more formidable during the last two or three years, and the value of the bacteriological diagnosis as a means of studying its progress has greatly augmented. The particulars relating to this subject have been fully set forth, and a most valuable analysis of those given for 1900 by Professor Delépine has been included in this Report.

The preparation of the Annual Statement on the Notification of Phthisis has been entrusted to my Senior Assistant (Dr. James Beatty). It will be found valuable in the further consideration of preventive measures.

The section on Enteric Fever has been prepared by Dr. Cowie, who has also prepared the curves showing the history of Scarlet Fever, Enteric Fever, and Diarrhœa in Manchester, and the charts for Enteric Fever in 1901.

The statement on the administration of the Milk Clauses has been prepared by the Veterinary Surgeon, Mr. Brittlebank. In some respects it is not very hopeful, but the proportion of milks entering the City which are shown to be tuberculous has diminished.

Summaries of the Bacteriological work done by Professor Delépine for the Sanitary Authority in respect of Enteric Fever, Diphtheria, and the examination of milk and sputum for Tubercle Bacilli, are given in the Report under the respective headings.

In accordance with the requirements of the Factory and Workshop Act, 1901, I have included a report on the work of the Sanitary Authority under the Act for 1901.

The Housing of the Working Classes has received much consideration during the past year, and the development of the Blackley Estate in such a manner as to secure a maximum of advantage to the working classes, on a satisfactory financial basis, will entail much study.

It may be anticipated that the completion of the scheme of electric trams will do much to solve the problem of housing, though there will still remain numerous insanitary dwellings to be dealt with. A tabulated account is given of the work hitherto done by the Unhealthy Dwellings Sub-Committee.

For the reports on Monsall Hospital, on the details of Sanitary Administration, and on the work of the Cleansing Committee, I am indebted to the chief officers of those departments. To Mr. Holburn, Chief Inspector of Foods, is owing the report on Unwholesome Food.

I am indebted to Mr. Roos for the large amount of extra work and time which he has given in assisting me to prepare the Statistical Sections of the Report; and to Mr. T. L. Ellwood, Chief Clerk in the Public Health Office, I am also indebted for assistance in various ways.

I have the honour to be,
My Lord Mayor, Aldermen, and Councillors,
Your obedient Servant,
JAMES NIVEN,
Medical Officer of Health.

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ANNUAL REPORT.

STATISTICAL.

Those Census figures are not yet available which are necessary for a full exposition of the Mortality Statistics of the City. I have, therefore, divided the Statistical portion of the Report into two parts, the first dealing with the Census figures at present available, which enable us to consider the death-rates in the different Sanitary Districts of the City for a period of ten years, and a second part which is concerned with the figures pertaining to the year 1901. I hope, next year, to give a fuller statistical survey of the City, when all the data from the Registrar-General's Office have been received.

PART I.—Relating to the Ten Years 1891 to 1900.

The Census populations for the whole City, its main divisions, and the Civil Parishes or Sanitary Districts into which those main divisions are divided having been readjusted by referring persons in Public Institutions to the districts to which they belong, as nearly as can be estimated, and by including and referring to their proper districts those Manchester persons at the time of the Census present in Workhouses outside, we get a table of populations for the Census in 1901 which we can compare with the similar table for 1891, and on which we can estimate the increase in the whole City, its main divisions, and Sanitary Districts respectively.

TABLE I.—POPULATION, 1901. CORRECTED FOR INSTITUTIONS.

STATISTICAL DIVISIONS		Census Population, 1901	Corrected Population, 1901	Corrected to Middle of 1901	Difference per cent. as compared with 1891
City of Manchester		**543,872**	**545,426**	**546,408**	**+ 7·46**
I.	Manchester Township	132,316	135,358	135,006	— 8·93
II.	North Manchester	169,841	166,105	167,257	+ 33·28
III.	South Manchester	241,715	243,963	244,145	+ 4·13
I.	Ancoats	44,040	45,083	44,998	— 4·61
	Central	30,012	30,241	30,037	— 21·53
	St. George's	58,264	60,034	59,971	— 4·44
II.	Cheetham	37,947	37,007	37,207	+ 28·67
	Crumpsall	11,995	8,825	8,852	+ 16·97
	Blackley	9,012	8,840	8,878	+ 23·17
	Harpurhey	15,489	15,665	15,893	+ 84·77
	Moston	11,897	11,921	12,161	+ 130·45
	Newton	40,533	40,391	40,525	+ 18·42
	Bradford	23,427	23,693	23,766	+ 17·21
	Beswick	11,516	11,647	11,686	+ 18·79
	Clayton	8,025	8,116	8,289	+ 141·04
III.	Ardwick	40,906	41,307	41,454	+ 17·14
	Openshaw	26,835	27,290	27,358	+ 12·29
	West Gorton	28,853	29,351	29,459	+ 17·68
	Rusholme and Kirk	20,311	20,469	20,544	+ 17·56
	Chorlton-on-Medlock	57,894	58,021	57,956	— 2·83
	Hulme	66,916	67,525	67,374	— 7·10

This table becomes additionally instructive when we compare it with the corresponding table given in the Report on the Health of Manchester for the years 1891-93, prepared by Dr. Tatham.

The population of the whole City has undergone an increase, less, indeed, than that in the previous decade, but still equal to 7·46 per cent.

The Manchester Township, however, has sustained a marked decrease of population as compared with the previous decade. The same is true of the centrally placed district of Hulme in South Manchester, and the previous increase in Chorlton-on-Medlock is changed to a decrease. The diminution of population in the central parts of the City is out of all proportion to the diminution in the increase of the City as a whole. This decrease is the result of commercial encroachment, railway schemes, improvement schemes, and sanitary improvements, and suggests anything rather than arrested development. It is due, in fact, to an increase in the development of commerce, and corresponds to an increased rate of growth of population. A considerable part of the increased population, however, is distributed over numerous outlying districts, and does not add to the population of the City. This is also the healthiest part of the new population, and a tendency is thereby created to an increased rate of mortality within the City.

Although South Manchester has ceased to increase at the same pace, owing to the encroachments which are taking place on its most populous districts, in four out of six districts the rate of growth is considerable. This is, at all events in Rusholme, an industrial expansion at the expense of the more wealthy classes, who are moving outwards, and it cannot be expected to lower the death-rate of the district.

In North Manchester the expansion is a great and a purely industrial one on a community mainly industrial. There is, thus, no change in the social position of the inhabitants which could obscure the effects of improved sanitary conditions, and, in effect, a marked improvement is, on the whole, manifest. The districts which have increased most rapidly are Harpurhey, Moston, and Clayton. The next decade will probably witness a large increase in the extensive districts of Blackley and Moston.

The next step is to reconstruct the populations at the middle of each year during the decade 1891–1900. These are calculated on the hypothesis of a uniform geometrical rate of increase from the Census of 1891 to that of 1901 in each district.

When this is done, a general tendency exhibits itself for the sum of the populations to fall below that of the population of the whole City, estimated in the same manner, and adjustment becomes necessary. This is effected by first of all adjusting the populations of the three main divisions of the City to those of the whole City, by proportional parts, and then adjusting the populations of the Sanitary Districts to those of the principal divisions. In the result we get the following table, showing the populations at the middle of each year from 1891–1900 :—

TABLE 2.—POPULATION 1891–1901. CORRECTED FOR INSTITUTIONS AND CENSUS POPULATION OF 1901.

STATISTICAL DIVISIONS		1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	MEAN POPULATIONS 1891–1901	1901
City of Manchester		**508,462**	**512,135**	**515,835**	**519,561**	**523,314**	**527,094**	**530,901**	**534,736**	**538,599**	**542,490**	**525,314**	**546,408**
I.—Manchester Township		148,313	147,060	145,788	144,499	143,193	141,868	140,527	139,169	137,796	136,409	142,219	135,006
II.—North Manchester		125,559	129,331	133,189	137,134	141,167	145,290	149,502	153,805	158,198	162,681	143,342	167,257
III.—South Manchester		234,590	235,744	236.858	237,928	238,954	239,936	240,872	241,762	242,605	243,400	238,855	244 145
I.	Ancoats	47,223	47,056	46,875	46,684	46,480	46,265	46,037	45,798	45,548	45,286	46,218	45,014
	Central	38,316	37,442	36,578	35,725	34,883	34,048	33,227	32,415	31,614	30,826	34,429	30,047
	St. George's	62,774	62,562	62,335	62,090	61,830	61,555	61,263	60,956	60,634	60,297	61,486	59,945
II.	Cheetham	28,967	29,788	30,615	31,445	32,276	33,108	33,939	34,766	35,588	36,403	32,504	37,207
	Crumpsall	7,581	7,721	7,861	7,997	8,131	8,261	8,387	8,511	8,629	8,743	8,136	8,852
	Blackley	7,220	7,392	7,565	7,736	7,906	8,075	8,240	8,405	8,566	8,724	7,938	8,878
	Harpurhey	8,616	9,187	9,790	10,425	11,096	11,801	12,543	13,322	14,140	14,996	11,528	15,893
	Moston	5,286	5,763	6,278	6,834	7,437	8,086	8,787	9,542	10,353	11,224	7,906	12,161
	Newton	34,279	34,961	35,634	36,298	36,949	37,589	38,214	38,821	39,411	39,979	37,004	40,525
	Bradford	20,311	20,693	21,069	21,440	21,802	22,157	22,503	22,837	23,160	23,470	21,822	23,766
	Beswick	9,854	10,054	10,250	10,444	10,635	10,823	11,007	11,184	11,358	11,526	10,679	11,686
	Clayton	3,445	3,772	4,127	4,515	4,935	5,390	5,882	6,417	6,993	7,616	5,280	8,289
III.	Ardwick	35,414	36,025	36,638	37,248	37,857	38,465	39,069	39,672	40,270	40,864	38,055	41,454
	Openshaw	24,381	24,698	25,011	25,321	25,626	25,927	26,224	26,516	26,802	27,083	25,699	27,358
	West Gorton	25,050	25,495	25,940	26,385	26,829	27,272	27,713	28,153	28,591	29,027	26,976	29,459
	Rusholme and Kirk.	17,487	17,796	18,105	18,413	18,720	19,028	19,334	19,639	19,943	20,244	18,822	20,544
	Chorlton-on-Medlock	59,683	59,591	59,482	59,354	59,209	59,044	58,862	58,662	58,444	58,209	58,906	57,956
	Hulme	72,575	72,139	71,682	71,207	70,713	70,200	69,670	69,120	68,555	67,973	70,202	67,374

The mean populations are also given in the above table, calculated for each district according to the formula $\frac{P_1(r-1)}{\log_e r}$, where P_1 is the population at the beginning of 1891 or the beginning of 1901 according as the population is increasing or decreasing, and r is the rate of increase from the lower to the higher population.

Now, in almost every increasing district of the City, there was comparative stagnation during the first half of the decade, and comparatively rapid increase during the second half. In the districts with decreasing populations, the decrease was generally more rapid in the first half of the decade. The effect is that the actual populations at intervening years were generally under those calculated on the hypothesis of a geometrical progression.

The attached curve shows for Harpurhey the mode of increase on the hypothesis of a geometrical progression, and the approximate actual mode of increase.

Let A N_1 represent the population in the beginning of 1891 in a rapidly increasing district; B N_2 the population at the end of 1900. Then the straight line A B represents how the population would increase had the amount of increase been equal year by year. The curve immediately below this line represents the manner in which the population increased on the hypothesis of geometrical progression. The lowest curve represents the actual mode of increase.

It is possible to compare these modes of increase in some districts, in which we know the number of new houses inhabited in each year, and in which no corresponding removal of houses was taking place, and it is desirable to do so that we may see how far our populations as calculated on the hypothesis of a geometrical progression can deviate from the true populations.

Now Harpurhey is one of the districts in which the population has increased most rapidly during the decade. Referring to the table on page 160 of the Annual Report on the Health of Manchester for the year 1900, we find the following figures, which relate to corresponding dates in successive years:—

Number of new dwelling-houses certified as fit for human habitation in the various divisions of the City between 1890 and 1900.

	1st November, 1890, to 31st October, 1891	1891 to 1892	1892 to 1893	1893 to 1894	1894 to 1895	1895 to 1896	1896 to 1897	1897 to 1898	1898 to 1899	1899 to 1900	1900 to 1901
Harpurhey	55	60	60	170	191	342	253	346	327	169	129

Total, 1,973.

From these we compute that there were new houses occupied in Harpurhey:

From middle of 1891 to middle of 1892	1892 to 1893	1893 to 1894	1894 to 1895	1895 to 1896	1896 to 1897	1897 to 1898	1898 to 1899	1899 to 1900	1900 to 1901
58	60	133	184	292	283	315	333	222	142

Total, 2,022.

Now we may assume that the populations, as computed on the hypothesis of geometrical progression, are, at the middle of 1891 and 1901, very nearly correct. These are respectively 15,893 and 8,616, and the increase is 7,277, corresponding to 2,022 new dwellings, or 3·599 persons to each house.

Multiplying, then, the above number of new houses in each year by the number 3·599, and adding the product to the population of the previous year, we get as the populations at the middle of each year the following :—

1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901
8616	8825	9041	9520	10182	11233	12252	13385	14583	15382	15893

The corresponding populations on the hypothesis of a geometrical progression are as follows :—

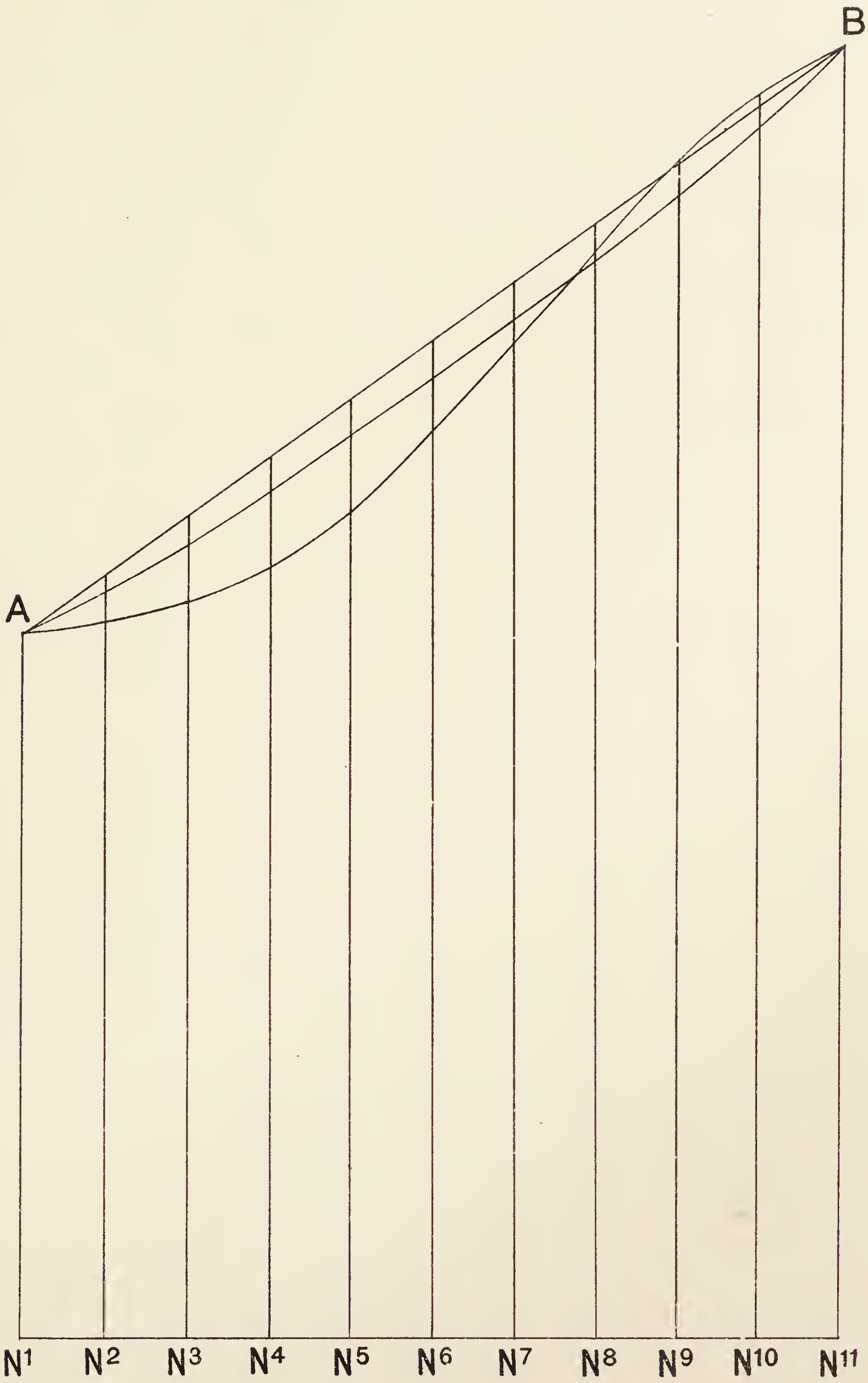
	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901
Corrected	8616	9187	9790	10425	11096	11801	12543	13322	14140	14996	15893

Now the mean population for the period is the area intercepted between the curve the lines AN_1 BN_{10} and the base line N_1 N_{10} divided by the base line N_1 N_{10}. The mean population on the hypothesis of a geometrical progression is therefore greater than the actual mean population. But that is purely because the rapid increase took place at the beginning of the decade. Had the rapid increase taken place in the first half of the decade the lower curve would have come between the straight line AB and the curve of geometrical progression, or commenced above and cut across the line AB, and the actual mean population would have exceeded the mean population, as deduced from a geometrical progression.

The area of the curve of actual progression is approximately $\frac{1}{10}\left[\frac{8478}{4} + \frac{3}{4} \times 8616 + 8825 + 9041 + 9520 + 10182 + 11238 + 12252 + 13385 + 14583 + \frac{1}{4} \times 15382 + \frac{3}{4} \times 15893 = 11311{\cdot}1\right]$ the base being taken as 1, and this is, therefore, the mean population approximately.

We may, now, go on to reconstruct the death-rates of the districts. These are reckoned on the populations calculated as changing annually in geometrical progression, but corrected as above mentioned. The deaths for the ten years are given in Table 3.

The death-rates for each year, and the average death-rates for each district in quinquennial periods, and over the whole of the ten years, also the mean death-rates for each district, and the mean birth-rates, are then readily calculated. It will be understood that the populations and deaths in institutions are both distributed to their respective districts.



CHART

Showing Progression of Populations, geometrically and in proportion to new houses, from the middle of 1891 to the middle of 1901. The letterpress and figures relate to the beginning of those years. This change causes no appreciable difference to the shape of the curves.

TABLE 3.—MANCHESTER DEATHS FROM ALL CAUSES.

	STATISTICAL DIVISIONS	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	Total
	City of Manchester	**13,202**	**11,893**	**12,559**	**10,355**	**12,915**	**11,874**	**11,990**	**11,493**	**13,046**	**12,903**	**122,230**
I.	Manchester Township	4,756	4,441	4,462	3,718	4,634	4,261	4,181	3,740	4,436	4,177	42,806
II.	North Manchester	2,709	2,401	2,583	2,070	2,659	2,514	2,601	2,708	2,977	3,005	26,227
III.	South Manchester	5,737	5,051	5,514	4,567	5.622	5,099	5,208	5,045	5,633	5,721	53,197
I.	Ancoats	1,613	1,422	1,536	1,251	1,438	1,364	1,345	1,234	1,457	1,320	13,980
	Central	1,217	1,178	1,069	998	1,228	1,051	1,030	893	992	1,019	10,675
	St. George's	1,926	1,841	1,857	1,469	1,968	1,846	1,806	1,613	1,987	1.838	18,151
II.	Cheetham	502	440	447	384	510	444	505	478	496	544	4,750
	Crumpsall	149	123	118	93	130	146	106	110	136	125	1,236
	Blackley	172	130	170	125	149	120	121	142	161	147	1,437
	Harpurhey	175	172	205	133	210	231	223	268	314	282	2,213
	Moston	89	81	84	66	108	111	120	144	156	169	1,128
	Newton	760	749	737	628	736	661	739	720	781	747	7,258
	Bradford	540	427	498	422	533	535	499	523	577	574	5,128
	Beswick	252	220	232	156	212	180	187	227	233	268	2,167
	Clayton	70	59	92	63	71	86	101	96	123	149	910
III.	Ardwick	926	732	818	650	898	778	804	801	910	971	8,288
	Openshaw	557	519	616	448	597	585	526	536	601	589	5,574
	West Gorton	574	522	619	503	655	554	567	565	628	630	5,817
	Rusholme and Kirk	298	268	303	267	298	289	289	337	341	346	3,036
	Chorlton-on-Medlock	1,365	1,249	1,304	1,103	1,301	1,247	1,220	1,169	1,335	1,302	12,595
	Hulme	2,017	1,761	1,854	1,596	1,873	1,646	1,802	1,637	1,818	1,883	17,887

TABLE 4.—DEATH-RATES ON THE HYPOTHESIS OF A GEOMETRICAL RATIO OF INCREASE.

STATISTICAL DIVISIONS		1891	1892	1893	1894	1895	1896	1897	1898
City of Manchester		**25·97**	**23·22**	**24·35**	**19·93**	**24·68**	**22·53**	**22·58**	**21·49**
I.—Manchester Township		32·07	30·20	30·60	25·73	32·36	30·04	29·75	26·87
II.—North Manchester		21·58	18·57	19·39	15·10	18·84	17·30	17·40	17·61
III—South Manchester		24·46	21·43	23·28	19·20	23·53	21·25	21·62	20·87
I.	Ancoats	34·16	30·22	32·77	26·86	30·94	29·48	29·22	26·94
	Central	31·76	31·78	29·23	27·94	35·20	30·87	31·00	27·55
	St. George's	30·68	29·43	29·79	23·66	31·83	29·99	29·48	26·46
II.	Cheetham	17·33	14·77	14·60	12·21	15·80	13·29	14·88	13·75
	Crumpsall	19·65	15·93	15·01	11·63	15·99	17·67	15·91	12·92
	Blackley	23·82	17·59	22·47	16·16	18·85	14·86	14·68	16·90
	Harpurhey	20·31	18·72	20·94	12·79	18·93	19·58	17·78	20·12
	Moston	16·84	14·06	13·38	9·66	14·52	13·73	13·66	15·09
	Newton	22·17	21·42	20·68	17·30	19·92	17·59	19·33	18·55
	Bradford	26·59	20·64	23·64	19·68	24·45	24·15	22·18	22·90
	Beswick	25·57	21·88	23·16	14·84	19·84	16·63	16·99	20·30
	Clayton	20·32	15·64	22·30	13·95	14·39	15·96	17·17	14·96
III.	Ardwick	26·15	20·32	22·33	17·45	23·72	20·23	20·58	20·19
	Openshaw	22·85	21·01	24·63	17·69	23·30	22·56	20·06	20·17
	West Gorton	22·91	20·48	23·86	19·06	24·36	20·31	20·46	20·07
	Rusholme and Kirkmanshulme	17·04	15·06	16·74	14·50	15·92	15·19	14·95	17·16
	Chorlton-on-Medlock	22·87	20·96	21·92	18·58	21·97	21·12	20·73	19·93
	Hulme	27·79	24·41	25·86	22·41	26·49	23·45	25·87	23·68

TABLE 4.—DEATH-RATES ON THE HYPOTHESIS OF A GEOMETRICAL RATIO OF INCREASE—*continued.*

	STATISTICAL DIVISIONS	1899	1900	Average 1891–95	Average 1896–1900	Average 1891–1900	Births Registered 1891–1900	Mean Birth-rate 1891-1900	Mean Death-rate 1881–1890 24·250; 1891–1900
	City of Manchester	**24·22**	**23·79**	**23·630**	**22·920**	**23·275**	**173,808**	**33·09**	**23·268**
	I.—Manchester Township	32·19	30.62	30·192	29·895	30·044	50,501	35·51	30·099
	II.—North Manchester	18·82	18·47	18·693	17·920	18·306	45,953	32·06	18·299
	III.—South Manchester	23·22	23·51	22·377	22·093	22·235	77,354	32·39	22·323
I.	Ancoats	31·99	29·15	30·928	29·756	30·372	17,553	37·98	30·248
	Central	31·38	33·06	31·182	30·771	30·976	10,597	30·78	31·006
	St. George's	32·77	30·48	29·077	29·836	29·457	22,351	36·35	29·521
II.	Cheetham	13·94	14·94	14·943	14·161	14·502	10,311	31·72	14·613
	Crumpsall	15·76	14·30	15·642	15·313	15·478	2,008	24·68	15·192
	Blackley	18·80	15·37	19·777	16·120	17·949	2,157	27·17	18·103
	Harpurhey	22·21	18·81	18·331	19·697	19·014	4,047	35·11	19·197
	Moston	15·07	15·06	13·690	14·520	14·105	2,158	27·30	14·268
	Newton	19·82	18·69	20·299	18·792	19,546	11,320	30·59	19·614
	Bradford	24·91	24·46	22·998	23·719	23·358	8,333	38·19	23·499
	Beswick	20·51	23·25	21·060	19·537	20·298	4,055	37·97	20·292
	Clayton	17·59	19·56	17·319	17·048	17·183	1,564	29·62	17·235
III.	Ardwick	22·60	23·76	21·993	21·468	21·730	13,213	34·72	21·779
	Openshaw	22·65	21·75	21·896	21·437	21·666	9,297	36·18	21·690
	West Gorton	21·97	21·70	22·135	20·902	21·519	9,778	36·25	21·564
	Rusholme and Kirkmanshulme	17·06	17·09	15·852	16·249	16·050	4,843	25·73	16·130
	Chorlton-on-Medlock	22·84	23·37	21·282	21·397	21·339	15,896	26·99	21·382
	Hulme	26·52	27·69	25·394	25·442	25·418	24,327	34·65	25·479

The chief value of this table lies in the indications which it affords of sanitary progress or retrogression, and, unfortunately, there is no ready means of comparing this period with previous epochs with any security that the facts would correspond. What we may profitably do is to study the figures for the ten years with a view to seeing how we stand in respect of individual districts during the decade, and how the second half of the period compares with the first.

The first fact which strikes us is the high death-rate which still prevails in the Manchester Township in each district. There is an important fact to be mentioned in mitigation of this. There appears to be no doubt that the Union Infirmaries are in special favour with the poorest classes, and that a large number of persons reside in the City for short periods with a view to qualify for admission. These persons, many of them, die in the Infirmaries. I hope to be able to obtain some estimate, in future, of the extent to which this prevails. But there seems to be no doubt that the Manchester death-rate is in this way artificially augmented, the increase falling on the Central districts, and that there is no corresponding outgoing element.

Then, again, these are pre-eminently the districts occupied by lodging-houses, and inhabited by the very poorest class of labourers, and by large numbers of wretched persons, features which are more and more affecting Hulme and Chorlton-on-Medlock.

Of the other districts which are conspicuous by their high death-rates, the most notable are the populous district of Hulme in South Manchester and Bradford in North Manchester.

Now in the production of a high death-rate intense poverty is a formidable factor. The readiest means of determining this factor appeared to be to differentiate the death-rate occurring in the Union Infirmaries from the death-rate in other Institutions and from the death-rate at home. This has been done since 1895 for each Sanitary District.

We thus get two lines of poverty, absolute and comparative, which we can treat separately or together, according to circumstances.

If we consult the tables which show these death-rates differentiated, we find that the factor of want is most conspicuous in the Central district, then in St George's, then in Ancoats; but that it is also a marked feature in Hulme and Chorlton-on-Medlock.

We also find that since 1895 it has become much more prominent in both districts, and that in 1900 Hulme actually passed Ancoats in respect of its pauper death-rate.

The death-rate in Chorlton-on-Medlock in respect of persons dying at their own houses is remarkably low, a fact which obscures the effect of the pauper death-rate.

These are features in the life of the City which require careful attention. The death-rates prevailing in Chorlton-on-Medlock, on the other hand, are sufficient proof that a large element of the poorer class of people does not necessarily produce a very high death-rate.

In Bradford there is no such aggregation of the poorest class of the population, and some factors must be at work having a special effect in the production of disease, other than want.

As I have repeatedly stated before, a house-to-house inspection ought to be made of this district.

Similar remarks apply, though in a less degree, to West Gorton, Openshaw, Ardwick, Beswick, and Harpurhey.

We may now go on to inquire what evidence of retrogression or advance is evident in the death-rates of the quinquennium 1896–1900 as compared with those of 1891–95.

On a comparison of the average death-rates for ten years with the mean death-rates, and on consideration of the errors likely to be introduced, we conclude that a comparison of the quinquennial averages of the death-rates should yield sufficiently reliable data. Taking, then, the average death-rates, we find that the average for the second quinquennium is lower than for the first over the whole City by 0·7 per 1,000. This corresponds roughly to the improvement from the middle of 1893 to the middle of 1898, and if it were continuous would mean an improvement of 1·4 per 1,000 in the death-rate of the ten years. In the Manchester Township there is an improvement, but only to the extent of 0·3 per 1,000, corresponding to 0·6 per 1,000 in the ten years. As we have seen, however, there are facts pulling in the opposite direction in the central parts of the City. In South Manchester the improvement is still less, being 0·28, or for ten years = 0·56 per 1,000. In North Manchester the improvement is equal to 0·77, or for the ten years to 1·54 per 1,000 on the annual death-rate.

When we come to the individual districts of the Manchester Township, we see that Ancoats shows a handsome improvement of 1·2 per 1,000, or 2·4 per 1,000 in ten years. The Central district shows an average annual improvement in the quinquennium of 0·4 per 1,000. St. George's, on the other hand, retrogresses to the extent of 0·8 per 1,000, equal to 1·6 on the ten years. This must be regarded as a serious recession.

In considering the other districts the advance or retrogression as extended to ten years will not be given, and must be understood. Taking the sanitary districts of South Manchester, we find that Ardwick shows an advance per 1,000 on the annual death-rate of 0·5, Openshaw of 0·54, West Gorton of 1·2.

All these districts border on North Manchester. In the more truly southern parts of South Manchester there is retrogression in Rusholme = 0·4 per 1,000, in Chorlton-on-Medlock = 0·1 per 1,000, and in Hulme = 0·05 per 1,000. These last two are but small retrogressions, but affect a large population.

Coming now to North Manchester, we find again an advance of 0·78 per 1,000, a large improvement on a death-rate already remarkably low, and on reference to the table of new buildings it will be seen that the advance has been really greater than appears.

In Crumpsall there is an improvement of 0·33 per 1,000.

In Blackley the average death-rate is lowered by 3·66 per 1,000. The population is small, and we can hardly hope that such an advance will be sustained, but reference to the tables would seem to suggest that it is a permanent gain.

In Harpurhey, again, we are presented with a serious retrogression equal to 1·365 per 1,000. This is partly due to the phenomenally low death-rate of 1894 which affected every part of the City, but was particularly manifest in some of the outlying districts, of which Harpurhey was one.

We have already seen that the death-rate is altered according to the mode in which the district increases, and we have given populations for Harpurhey founded on the number of new houses built. Calculating the death-rates on these populations we get :—

ANNUAL DEATH-RATES.

1891	1892	1893	1894	1895	1896	1897	1898	1899	1900
20·311	19·490	22·674	13·971	20·625	20·564	18·201	20·022	21·532	18·333

The average death-rate for the first five years is 19·394, for the second five years 19·683. There is on this calculation an increase of 0·289 per 1,000 on the average annual death-rate in the second quinquennium, an irreducible minimum which we must recognise. It is true 1·076 per 1,000 has been thus removed. If we calculate the mean death-rates for 1891-1900 on the mean populations of Harpurhey, increasing in geometrical progression and in the ratio of new houses occupied respectively, we get the first mean death-rate = 19·197, the second 19,565, which gives a difference of 0·37 per 1,000.

Similar alterations will, of course, affect the comparison in other very rapidly growing districts such as Moston and Clayton.

In Moston there is a retrogression equal to 0·8 per 1,000, but if the populations and death-rates were reconstructed as in Harpurhey the whole of this would disappear. Newton Heath shows the very large improvement of 1·5 per 1,000.

Bradford exhibits a falling off equal to 0·7 per 1,000, and there is no deduction to be made which would materially reduce the amount, nor is it accidental. A study of the statistics of this district, year by year, indicates that it requires special inspection.

Beswick shows the large gain of 1·5 per 1,000.

Clayton shows an apparent small gain of 0·27, but the real gain, if calculated as for Harpurhey, would be found considerable. The effect produced on these figures by a rapidly increasing population, though much less than in the three instances given above, should be borne steadily in mind. The improvement in Ardwick would, in this way, be considerably increased; not so that in Openshaw.

Unfortunately, we cannot ascertain the number of houses which have passed out of use in the City year by year during the ten years, but there is no doubt that the population increased very rapidly during the latter half of the decade, and the improvement may be taken as approaching 1 per 1,000 in the second quinquennium = to 2 per 1,000 in the ten years.

It should be observed, however, that during the past decade the birth-rate has exhibited a steady tendency to decline, and that this coupled with the previous high birth-rates would alter the constitution of the population so as to bring a comparatively large proportion of persons into the ages having a low death-rate. The improvement is, thus, not quite so great as it appears to be.

If we compare the mean death-rate in the decade 1891–1900 with that in 1881–1890 given in the table, it will be seen that the improvement was equal to 1 per 1,000.

There is therefore manifest a distinct improvement. This is most conspicuous in the Northern districts of the City, but is notable also in the other two divisions.

It is very marked in Ancoats, Cheetham, Blackley, Newton, Beswick, Ardwick, and West Gorton. There is decided retrogression in St. George's, Harpurhey, and Bradford. In the other districts there is slight improvement, or the death-rate is nearly stationary. On the whole, the results of this review are highly encouraging. The work of the Sanitary Committee in Ancoats appears to have borne good fruit, and the sum total is a marked improvement.

Probably, also, it is greater than it appears to be, since the year 1894, which is included in the earlier period, was remarkable for its low death-rate. Not only so, but in the later period summer diarrhœa has been a veritable scourge. With this encouragement we may go on to mention some of the causes which hinder a more rapid advance.

With regard to the City generally, the most urgent need is cleanliness; clean and intelligent habits of household and family management. Only an arduous effort to train the rising generation of girls in the care of infants and of the management of the house, and of boys in the care of workshops, will suffice to cope with the existing conditions. But a more strenuous effort is required on the part of the Sanitary Authority in the same direction.

The Sanitary Authority can also substitute for the present unsatisfactory arrangements clean methods of collecting and removing domestic refuse and excreta. This has already to some extent been done, but, in effect, only a beginning has been made, except as regards new houses, which are provided with water-closets.

Further, it is of great importance to keep the surface of the yards clean by maintaining an unbroken surface. Much excellent work has been done in recent years in the provision of good house drains. By these means—by means of good drainage and by impermeable surfaces in yards and passages—much has been, and much more can still be, effected. The social conditions of the people also require investigation as a preliminary to very successful action. We note that in 1900 the proportion of deaths in the Union Infirmaries to total deaths was higher than in any previous year since 1895—not a very favourable sign.

Why are certain districts of the City deteriorating, and especially St. George's, Harpurhey, and Bradford?

With regard to St. George's, the death-rate in this area has always been high. In that part of it which lies nearest to town is aggregated a considerable section of the most wretched part of the population. It is believed that this element is extending outwards.

Harpurhey, again, has become a densely-populated area since the previous census, and the great tip which crosses the valley of the Moston Brook must exercise some adverse influence on the health of the district.

The district of Bradford has a number of chemical works either within it or on its outer borders, and many people working at these works live within the district. It is probable that the death-rate of this constituent of the population is high, but the cause is insufficient to produce the effect observed. Moreover, in this district (as in West Gorton) there is steadily observed a very high infantile death-rate from Diarrhœa, a fact which is associated, for the most part, with a lower stratum of the industrial classes, with dirt and careless modes of feeding. Yet there is nothing like the amount of deep poverty in this district, at all events as manifested in the Union death-rates, that there is in Chorlton-on-Medlock or in Hulme. Assuredly the conditions of Bradford need special investigation, nor will a satisfactory solution of the death-rate be arrived at without a house-to-house inspection. The factors which have made for improvement will be discussed in the next Annual Report.

PART II.—Relating to the Year 1901.

The more outstanding figures relating to the year 1901 are as follows :—

Estimated population		546,408
Persons married in Manchester, Prestwich, and Chorlton Unions		11,844
Annual rate of persons married per 1,000 of population on an estimated population of 673,946		17·6
Births ...	Males......... 8,008 Females...... 7,683	15,691
Annual rate of births per 1,000 of the population		28·7
Deaths...	Males......... 6,128 Females...... 5,673	11,801
Annual rate of mortality per 1,000 of the population		21·6
Excess of registered births over deaths		3,890
Estimated increase of population during the year		3,918

Our attention is at once arrested by the striking drop in the birth-rate. The marriage-rate dropped from 18 per 1,000 in 1900 to 17·57 in 1901, and the birth-rate from 31·9 to 28·7 per 1,000. This can only be due to some very powerful influence affecting the condition of the people. This impression is much strengthened by the increased proportion of all deaths occurring in the Workhouse.

During the year, 2,734 deaths occurred in public institutions as against a total of 11,801 total deaths registered (as shown in Table 5). It was stated in the Annual Report for 1900 that the proportion of deaths occurring in public institutions, viz., 21·9 per cent., was the highest on record. But in 1901 this proportion was considerably exceeded, and the proportion rose to 23·2 per cent. During the ten years 1891 to 1900 the proportion of deaths in the Workhouse to all deaths was between one-eighth and one-ninth, in 1900 it was between one-seventh and one-eighth, in 1901 it was over one-seventh. This increase in the proportion of deaths occurring in the Workhouse is a striking fact which at once arrests attention.

TABLE 5.—POPULATIONS—DEATHS OF MANCHESTER RESIDENTS, 1901, IN PUBLIC INSTITUTIONS.

Township	NAME OF INSTITUTION	Population, 1901	Deaths, 1901
ANCOATS	Ancoats Hospital		139
	Workhouse Casual Wards (Tame Street)		...
CENTRAL	Workhouse Casual Wards		2
	Royal Infirmary		293
	St. Mary's Hospital		12
	Lock Hospital		...
	Eye and Ear Hospital		4
	Alsop's Boys' Home		...
	Chetham Hospital		...
	Consumption Hospital		...
	Children's Hospital (Gartside Street)		1
ST. GEORGE'S	Girls' Home (Charter Street)		...
CHEETHAM	His Majesty's Prison		7
	Boys' Refuge		...
	Girls' Friendly Society		...
	Clinical Hospital		75
	Fairy Hill Home for Working Lads		...
CRUMPSALL	Manchester Workhouse		869
*	Prestwich Workhouse		153
BLACKLEY	Manchester and Salford Reformatory		...
	Litchford Hall		6
MOSTON	St. Mary's Home		...
	St. Joseph's Home		...
	St. Bridget's Orphanage		...
NEWTON	Monsall Hospital		242
	Little Sisters of the Poor (Culcheth Hall)		6
CLAYTON	Clayton Hospital		2
ARDWICK	Industrial School		...
	Nicholls Hospital		2
OPENSHAW	Crossley's "Home of Peace"		18
RUSHOLME	St. Joseph's Girls' School		...
	St. Mary's Home		...
CHORLTON-ON-MEDLOCK	St. Joseph's Boys' School		...
	Royal Eye Hospital		...
	Little Sisters of the Poor (Plymouth Grove)		20
	Casual Wards (All Saints)		1
	Southern Hospital		17
	Cancer Hospital		18
	Maternity Home		6
	Home for Young Girls		...
	Rylands' Orphanage		...
	Church Army Labour Home		...
	Penitentiary		...
HULME	Cavalry Barracks		2
	Loretto Convent		...
* OUTSIDE CITY.	Withington Workhouse		731
	Pendlebury Hospital		30
	Prestwich Lunatic Asylum		43
	St. Anne's Home, Dunham Massey		3
	St. Joseph's Home, Patricroft		3
	Cottage Hospital, Accrington		1
	Robinson Kay Home for Incurables, Bury		1
	Stockport Workhouse and Infirmary		2
	Sanatorium, Eccles		1
	Salford Dispensary, Bethesda, and Hope Hospitals		24
	TOTALS		2,734

* Proportion only.

The average number of persons in receipt of outdoor relief each week was in 1901, 817, the highest figure attained since 1887. The figures for a number of years are given in the following table (Table 6). This table also shows that in 1901 there was an advance in the prices of flour, beef, and coal.

TABLE 6.—TOWNSHIP OF MANCHESTER.—PRICES PAID BY THE GUARDIANS FOR FLOUR, BUTCHERS' MEAT, AND COAL; ALSO THE AVERAGE NUMBER OF PERSONS IN RECEIPT OF RELIEF DURING THE YEARS 1887–1901.

YEAR ENDING	PRICES OF PROVISIONS						PAUPERISM		BIRTH-RATE PER 1,000
	Flour per Sack of 280lbs.	Butchers' Meat, per lb.			Coal, per ton		Average number of Paupers relieved in each week		
		Beef		Mutton	Engine	House			
		Coarse	Fine				Indoor	Outdoor	
1887	25/2 to 30/6	-/3¾	-/6½	-/6½	5/6	8/4	3123	877	33·9
1888	24/- to 29/3	-/3¾	-/6½	-/6½	5/5	8/3	3130	713	33·3
1889	24/11 to 31/2	-/4½	-/6½	-/6½	5/8	8/7	3037	632	33·1
1890	24/9 to 29/11	-/5	-/7	-/7	7/-	9/9	2998	498	31·8
1891	27/3 to 28/11	-/4¼	-/6½	-/6½	8/8	11/2	3118	466	33·8
1892	26/4 to 28/5	-/4	-/6¼	-/6¼	7/6	10/2	3251	551	33·4
1893	21/8 to 25/1	-/3⅞	-/6¼	-/6¼	6/5	10/0	3277	586	33·4
1894	17/2 to 23/9	-/3¾	-/6	-/6	7/1	10/10	3328	395	31·8
1895	15/6 to 21/-	-/3¾	-/6	-/6	5/6	10/3	3343	618	33·4
1896	16/6 to 24/-	-/3⅝	-/5¾	-/5¾	5/7	9/1	3348	533	32·8
1897	17/3 to 33/9	-/3½	-/5⅝	-/5⅝	5/9	8/8	3476	697	32·9
1898	26/7 to 33/8	-/3½	-/5½	-/5½	6/2	8/4½	3519	732	32·3
1899	20/11 to 23/-	-/3½	-/5⅝	-/5⅝	7/5	9/11	3232	597	32·2
1900	20/9 to 22/9	-/3½	-/5½	-/5⅝	11/9¾	14/2½	3189	686	32·4
1901	21/4 to 23/3	-/3⅝	-/5⅝	-/5⅝	11/8	15/2	3403	817	28·7

The death-rate is, it is true, not so high as the average, being 21·6 per 1,000, but the actual increase of population is only 7·1 per 1,000, an unprecedentedly low figure.

There is, apparently, a larger proportion of the population than hitherto below the line which divides poverty from pauperism.

It is of considerable interest to see whether these facts are general, whether the fluctuations of the exports in any way explains them, or whether they are due to entirely new factors. This is shown by Table 7.

TABLE 7.—SHOWING THE MARRIAGE, BIRTH, AND DEATH RATES IN ENGLAND AND WALES, WITH THE TOTAL VALUE OF EXPORTS OF BRITISH AND IRISH PRODUCTS, FOR THE YEARS 1865–1900.

Year	Population England & Wales	Rate to 1,000 Persons living			Births less Deaths per 1,000	Value of Exports in £ Millions	Year
		Marriages	Births	Deaths			
1865	21,145,151	17·5	35·4	23·2	12·2	166	1865
1866	21,409,684	17·5	35·2	23·4	11·8	189	1866
1867	21,677,525	16·5	35·4	21·7	13·7	181	1867
1868	21,948,713	16·1	35·8	21·8	14·0	179	1868
1869	22,223,299	15·9	34·8	22·3	12·5	190	1869
1870	22,501,316	16·1	35·2	22·9	12·3	200	1870
1871	22,788,594	16·7	35·0	22·6	12.4	223	1871
1872	23,096,495	17·4	35·6	21·3	14·3	256	1872
1873	23,408,556	17·6	35·4	21·0	14·4	255	1873
1874	23,724,834	17·0	36·0	22·2	13·8	240	1874
1875	24,045,385	16·7	35·4	22·7	12·7	223	1875
1876	24,370,267	16·5	36·3	20·9	15·4	201	1876
1877	24,699,539	15·7	36·0	20·3	15·7	199	1877
1878	25,033,259	15·2	35·6	21·6	14·0	193	1878
1879	25,371,489	14·4	34·7	20·7	14·0	192	1879
1880	25,714,288	14·9	34·2	20·5	13·7	223	1880
1881	26,046,142	15·1	33·9	18·9	15·0	234	1881
1882	26,334,942	15·5	33·8	19·6	14·2	242	1882
1883	26,626,949	15·5	33·5	19·6	13·9	240	1883
1884	26,922,192	15·1	33·6	19·7	13·9	233	1884
1885	27,220,706	14·5	32·9	19·2	13·7	213	1885
1886	27,522,532	14·2	32·8	19·5	13·3	213	1886
1887	27,827,706	14·4	31·9	19·1	12·8	222	1887
1888	28,136,258	14·4	31·2	18·1	13·1	234	1888
1889	28,448,239	15·0	31·1	18·2	12·9	249	1889
1890	28,763,673	15·5	30·2	19·5	10·7	263	1890
1891	29,081,962	15·6	31·4	20·2	11·2	247	1891
1892	29,401,898	15·4	30·5	19·0	11·5	227	1892
1893	29,725,358	14·7	30·8	19·2	11·6	218	1893
1894	30,052,397	15·1	29·6	16·6	13·0	216	1894
1895	30,383,047	15·0	30·4	18·7	11·7	226	1895
1896	30,717,355	15·8	29·7	17·1	12·6	240	1896
1897	31,055,355	16·0	29·7	17·4	12·3	234	1897
1898	31,397,078	16·3	29·4	17·6	11·8	232	1898
1899	31,742,588	16·5	29·3	18·3	11·0	264	1899
1900	32,091,907	16·0	28·9	18·3	10·6	291	1900

From this table we find that the value of exports was very much increased in 1899 and again in 1900, although a decline occurred in the birth-rate for the whole country in 1900. This decline in the birth-rate in 1900 is, however, no more than might be expected from the withdrawal of a large number of men in the prime of life.

There was not in Manchester in 1899 and 1900 a degree of diminution in business which would account for the depression of the birth-rate in 1901.

The decrease of the birth-rate observed in Manchester in 1901 is not general, and there is nothing corresponding to it in the records of trade or in the statistics for the country generally.

Whatever be the explanation of the increasing poverty, I would earnestly call attention to its importance and to the necessity of according to its causes a quite special study.

So singular an occurrence as the pronounced drop in the Manchester birth-rate for 1901 must, however, give one considerable cause for reflection. The elements for a judgment on its causes are these :—

There is a slight decrease in the birth-rate for the whole country, not amounting to more, however, than would easily be explained by the removal of a large number of men from the country. It is not at all comparable with what has occurred in Manchester. In 1899 the birth-rate for the whole country was 29·3, in 1900 28·9, and in 1901 28·5.

There is a distinct increase in the death-rate occurring in the Workhouse Hospital, begun in 1900 and continued into 1901. But there is no corresponding increase of pauper inmates.

The increased prices of food and coal may be assumed to have increased the amount of poverty. But these causes are general.

There is an increase in outdoor relief, but I am informed that too much importance must not be attached to this circumstance.

The value of exports greatly increased in 1900.

There is no reason to believe that trade is slack, and though building has fallen off in Manchester it has increased in Salford.

The first step, then, was to enquire whether the same drop had occurred in the birth-rate in Salford. It appears that quite as great a drop occurred in the neighbouring borough. The figures are as follows :—

BIRTH-RATE—SALFORD.

1891	36·3
1892	35·8
1893	34·7
1894	34·3
1895	35·9
1896	35·6
1897	35·2
1898	34·9
1899	34·1
1900	33·3
1901	29·1

Corrected for Census Population 1901.

A similar drop is visible in the birth-rate for Liverpool.

BIRTH-RATE—CITY OF LIVERPOOL.

1895	36·9
1896	34·9
1897	35·3
1898	35·2
1899	35·6
1900	36·0
1901	32·0

The cause is, thus, one common to the three. It cannot well be adversity.

Reflecting on these singular data, it occurred to me that possibly the remarkable outburst of arsenical poisoning in 1900 would account for it. If so, it must be allowed that the results are different from what one would have expected.

Yet, if we reflect how much disablement came to light, and if we consider the singular disparity between the increase of deaths in the workhouse and the number of inmates, some such explanation is strongly suggested. This would also partly explain the increase given later, in 1899–1900, of deaths from overlaying.

This line of enquiry appears well worth pursuing.

I may add that on my mentioning to Professor Delépine the conclusion to which I had come as to the connection between the arsenical outburst and the drop in the birth-rate, he suggested that the quarterly returns of births should show that the effect began in the middle of 1900 and was intense up to the end of the year. The following birth-rates show that this is brought out very clearly in the birth-rates of the second, third, and fourth quarters, the drop commencing in the second and culminating in the third quarter.

It is necessary to note, however, that over a large number of years there is a decided drop in the birth-rate, for the whole country, in the third quarter of the year :—

MANCHESTER BIRTH-RATES IN QUARTERS.

	1899	1900	1901
First Quarter	32·2	33·8	30·3
Second Quarter	33·9	33·0	28·9
Third Quarter	32·3	32·7	25·7
Fourth Quarter	30·8	28·4	29·8

SALFORD BIRTH-RATES IN QUARTERS.

	1899	1900	1901
First Quarter	33·8	35·3	31·2
Second Quarter	34·3	34·2	28·0
Third Quarter	33·5	32·1	25·8
Fourth Quarter	33·9	31·1	31·6

LIVERPOOL BIRTH-RATES IN QUARTERS.

	1899	1900	1901
First Quarter	35·3	38·4	36·2
Second Quarter	35·6	35·3	32·1
Third Quarter	35·9	36·2	31·2
Fourth Quarter	35·4	34·0	31·7

The only other large town which seems to have been considerably affected is Birkenhead. Here the decline in the birth-rate from 1900 is only 0·4 per 1000, and appears to be part of a general decline. The birth-rate was lowest in the first and third quarters.

It was not to be expected that Birkenhead would show the results of the arsenical outbreak so distinctly as Manchester, Salford, and Liverpool, as it is improbable that there would be relatively so large a proportion of persons drinking the arsenicated beer.

Taking Dr. Buchanan's report to the Local Government Board as a guide, I have written to the Medical Officers of Health of a number of smaller districts which suffered more or less from arsenical poisoning, and from the replies which they have courteously sent me I find that Stoke-upon-Trent, Wolverhampton, and Walsall were but slightly affected. These show no drop in the birth-rates.

The following are stated to have been severely visited:—Heywood, Warrington Rural, Lichfield Rural, and Ilkley. In the first-named the incidence appears to have been even more severe than in Manchester and Salford. There is here a recorded drop in the birth-rate from 24·61 in 1900 to 21·36 in 1901, and the third quarter of 1901 is most affected. In Lichfield Rural the recorded birth-rates are 30·9 in 1900 and 27·9 in 1901. At page 4 in the Annual Report for 1901 of the Medical Officer of Health (Dr. James Clark), we find that the birth-rates were in 1901, first quarter 31·3, second 29·8, third 23·8, fourth 26·6. At Ilkley there is a drop from 20 per 1000 in 1900 to 16 per 1000 in 1901. The Medical Officer of Health (Dr. Johnstone) cautions me against hasty conclusions in regard to the Ilkley birth-rates. As regards Warrington Rural, there is an apparent rise in the birth-rate of 1·2 per 1000 in 1901, but owing to the Census populations not quite coinciding with the estimates, and owing also to alterations in the district, this figure cannot be accepted. My Statistical Clerk (Mr. Roos) has, therefore, got out the comparable populations and birth-rates, which he finds to be as follows: Birth-rate in 1900, 28·87; in 1901, 29·02, showing a small increase in 1901 = 0·15 per 1000.

Besides these districts there are others which seem to have suffered in a moderate degree, viz., Chester, Darlaston Urban, Worksop, and Bilston. As regards Chester, the recorded birth-rate dropped from 28·2 to 26·7; but this is little more than a continuation of the drop in 1900.

In Darlaston Urban the birth-rate in 1901 is 39·59 per 1000. This is below the average of the previous five years, omitting 1900; and high as it is, taking into account the fact that the population seems to have been over-estimated previous to the Census, it is a decline on previous years.

At Worksop a drop of 3·88 per 1000 is recorded, but I do not at the moment possess the populations in previous years.

At Bilston a drop occurred in 1900, but no further drop in 1901.

In dealing with small populations, we have to be much more chary of conclusions than when we have large populations to draw conclusions from.

The new populations obtained at the recent Census may have materially modified the birth-rates in recent years. The removal of a few operatives by illness, due to arsenical paralysis, may not much modify the populations, as these can readily be replaced by fresh men. In rural districts perhaps only a small village population may have been affected. We cannot, therefore, expect that the same effects will be at once apparent on the surface. As it is a matter of urgency that the Annual Report shall be finished, I have not waited to sift all these details, but have simply given the facts available.

Generally speaking, they bear out the results obtained in Manchester and Salford, and in Liverpool.

It may be added that in the first quarter of 1902 the birth-rates in Manchester, Salford, and Liverpool have resumed their usual course, being for Manchester, 34·6 per 1,000; Liverpool, 35·6 per 1,000; Salford, 35·2 per 1,000.

When we examine the corresponding facts of total birth-rates and of birth-rates in quarters for a few years in a number of separate towns comparable with Manchester and Liverpool respectively, we do not find any such phenomenon as that noted for 1901 in the annual and quarterly birth-rates.

These figures may be taken as conclusive on the point in question.

Having thus touched upon the most striking features of the year 1901, we may dismiss the others summarily.

Illegitimacy has again somewhat increased in spite of the low birth-rate, the certified deaths numbering 1 per cent. of the total. Even this figure is unsatisfactory, and admits of reduction.

We may next devote some attention to the causes of death.

First of all, we may review the principal causes of death. These are as follows:—

Tubercular Disease	1,571	Scarlet Fever	127
Pneumonia	1,212	Cancer	425
Bronchitis	1,072	Premature Birth	334
Diarrhœa and Simple Cholera	1,010	Whooping Cough	224
Diseases of the Heart and Blood Vessels	1,396	Old Age	207
Measles	292	Convulsions	194
Debility, Inanition	616	Inflammation of Brain	151
Cirrhosis of the Liver	95	Insanity	143
		Bright's Disease	155
		Diphtheria	133

These may be usefully set side by side with the figures showing the balance of gain and loss of the year 1901 as compared with the previous ten years.

The principal gains and losses in 1901 as compared with the previous ten years are exhibited in the following table:—

Gains in 1901 per 1000 persons living.

Measles	0·23
Whooping Cough	0·18
Influenza	0·11
Enteric Fever	0·07
Puerperal Fever	0·01
Tubercular Disease other than Phthisis	0·12
Old Age	0·08
Brain and Nervous Diseases	0·31
Bronchitis	0·48
Pneumonia	0·28
Other Respiratory Diseases	0·07
Digestive Organs	0·06
Urinary Organs	0·01
Total	2·01

Losses in 1901.

Typhus Fever	0·02
Diphtheria	0·04
Erysipelas	0·02
Septicæmia	0·02
Diarrhœal Diseases	0·44
Rheumatic Fever	0·02
Phthisis	0·03
Cancer	0·10
Alcoholism	0·02
Heart and Blood Vessel Diseases	0·01
Total	0·72
Balance of Gain	1·29

We find that there is a net gain of 1·29 per 1,000 in the year. We perceive also that the largest losses are sustained under the heading "Diarrhœal Diseases." Again, in 1901, the terrible fatality from Summer Diarrhœa, which is pre-eminently a disease at once of poverty and neglect, asserts itself. This high continued death-rate from Diarrhœa is a sure indication that the poorest class of the population are existing under most unfavourable conditions.

From Cancer, again, there is an increase. The death-rate from this, the most formidable of all causes of death, is steadily increasing. The question of the increase of Cancer is one which is earnestly engaging the attention of scientific men, although, as yet, but little light has been cast on its etiology.

The death-rate from Measles in 1901 is again low, as compared with the average; but the chief gain in the year is under the heading "Chest Diseases." Phthisis, itself, shows no improvement; but Tubercular Diseases other than Phthisis exhibit some improvement. An improvement is also manifested under Whooping Cough and Influenza.

Thus, the improvement is mainly of a temporary character, being chiefly under the heading of "Diseases affecting the Chest," directly or indirectly, diseases which are themselves very fluctuating in their incidence.

A slow but steady increase is observed in the death-rate from Diphtheria, more than counter-balanced, however, by the gain under Enteric Fever.

Alcoholism, strange to say, shows a slight increase. On the other hand, the number of deaths from Cirrhosis of the Liver has diminished from 127 in 1900 to 95 in 1901.

At this point we may consider the deaths and death-rates for the City as a whole in infancy and childhood, as shown in Tables E and K in the Appendix. We have not, at present, the means of discussing profitably the death-rates at different age-groups.

The number of deaths under 1 year per 1,000 born in 1901 was 198·46, which is above the average of the previous five years by 6·3 per 1,000.

Now the Diarrhœa mortality under 1 year of age was, in 1901, 47·54 per 1,000, and the average Diarrhœa mortality in infants for the previous five years was 38·31 per 1,000.

Thus the infantile Diarrhœa rate of mortality exceeded the average for the previous five years by 9·2 per 1,000, or by more than the total excess of the infant mortality in 1901 from all causes.

A marked improvement in the infantile death-rate from Tubercular Disease was manifest in 1900. There is a slight falling-off in 1901, though there is still a decided improvement on this death-rate in years previous to 1900. On the other hand, the steady improvement which had been taking place under the heading "Convulsions," and which one had been regarding as a proof of improved methods of feeding infants, is no longer manifest. In Lung Diseases there is an improvement. From Wasting Diseases there is an increased fatality, which again seems to mark a diminished attention to the welfare of infants. It is perhaps worth noting that to Wasting Diseases was ascribed a specially high fatality during the years 1898 and 1899.

The most conspicuous fact, however, is the excessive death-rate from Diarrhœa.

It is worth noting the proportion of children found dead in bed who were suffocated :—

	1897	1898	1899	1900	1901
Found dead in bed under 1 year, per 1,000 births.	5·33	5·78	6·49	5·75	5·16
Total number found dead in bed	94	101	114	101	81
Of these, there were suffocated	61	61	65	74	68

Undoubtedly this figure has a relation with intoxication, and it would therefore seem as if there had been a wave of drinking which reached its acme in 1899-1900, and which is now subsiding.

From Table L in the Appendix we obtain a view of the death-rate from different diseases per 1,000 of the population.

These death-rates are subject to two considerations which have to be borne in mind in assessing their significance. When a disease affects especially a particular age-group, in order to judge of its severity we require to know the numbers living at the ages under consideration. The death-rates of particular diseases per 1,000 of the population, being dependent on the distribution of the population according to age, are not strictly comparable for different districts and at different periods.

In addition, there is in almost every disease a certain amount of doubtful or erroneous diagnosis.

Making due allowances for these difficulties, we may still obtain useful information from tables relating to disease, particularly if the differences between death-rates are well marked.

Taking, first, infectious diseases, we find that the following diseases showed a death-rate under the average :—Measles, Influenza, Whooping Cough, Enteric Fever, Tubercular Diseases other than Phthisis.

In Diarrhœa the death-rate exceeded the average.

From Phthisis, Septic Diseases, and Diphtheria there was a slight increase on the average.

Cancer showed a marked excess.

From all remaining causes tabulated there was improvement, especially marked under Chest Diseases.

Comparison of different Districts.

We have seen that a drop occurred in the birth-rate for the year 1901, and it will be of interest to compare the birth-rates in the different Sanitary Districts of the City with the mean birth-rates for the 10 years 1891 to 1900, with a view to see whether this drop is general, or falls more especially on particular parts of the City.

For this purpose I would refer to the table of the mean birth-rates in the Sanitary Districts for the 10 years 1891 to 1900, given in Part I.

Comparing, then, Table H in the Appendix with the table of mean birth-rates we perceive that the decline is general, but is greatest in the Manchester Township, where it amounts to 6·43 per 1,000; next greatest in South Manchester, where it is 4·53 per 1,000; and least in North Manchester, where it is 2·39 per 1,000.

If, now, we turn to Table 8, showing the death-rates at home, in the Workhouse, and in other institutions, we find that the death-rates of persons dying in the Workhouse are: In the Manchester Township, 6·39 per 1,000; in the Southern District, 3·01 per 1,000; and in the Northern District, 0·94 per 1,000.

TABLE 8.—1901.—DEATH-RATES* IN THE HOMES OF THE PEOPLE, IN WORKHOUSES, AND IN HOSPITALS FOR THE VARIOUS DIVISIONS OF THE CITY, CALCULATED ON THE CENSUS OF 1891 AND 1901.

STATISTICAL DIVISIONS	Estimated Populations	Death-rate per 1000 of persons dying in their own homes	Death-rate per 1000 of persons dying in Workhouses	Death-rate per 1000 of persons dying in Hospitals	Total death-rate per 1000
City of Manchester....	**‡ 546,408**	**16·59**	**3·21**	**1·79**	**21·60**
I. Manchester Township	135,006	18·41	6·39	2·72	27·52
II. Northern Districts ...	167,257	15·20	0·94	1·43	17·57
III. Southern Districts ...	244,145	16·54	3·01	1·52	21·08
I. Ancoats	45,014	20·50	4·91	2·91	28·32
I. Central	30,047	16·61	9·35	3·26	29·22
I. St. George's	59,945	17·75	6·02	2·30	26·07
II. Cheetham	37,207	11·64	0·91	1·64	14·19
II. Crumpsall	8,852	13·90	0·34	1·81	16·04
II. Blackley...............	8,878	13·29	0·68	1·69	15·66
II. Harpurhey............	15,893	15·23	0·69	1·26	17·18
II. Moston	12,161	14·14	0·33	0·74	15·21
II. Newton Heath	40,525	15·37	1·06	1·14	17·57
II. Bradford	23,766	19·15	1·56	1·35	22·05
II. Beswick	11,686	19·51	1·11	2·22	22·85
II. Clayton	8,289	17·85	0·72	1·69	20·27
III. Ardwick	41,454	17·18	2·03	1·66	20·87
III. Openshaw	27,358	17·07	1·46	1·64	20·18
III. West Gorton	29,459	15·75	1·70	1·63	19·08
III. Rusholme and Kirk..	20,544	16·06	1·85	1·12	19·03
III. Chorlton-on-Medlock	57,956	14·06	4·24	1·33	19·64
III. Hulme	67,374	18·57	4·13	1·63	24·33

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* In this table, *every death* occurring in a Public Institution has been referred to the District from which the patient originally came.

‡ Population estimated to middle of 1901 on new Census population.

The decrease in the birth-rate is therefore in close relationship with the poverty death-rate, and is greatest where the latter is highest.

With this key it will be interesting to note the amount of the decline in different Sanitary Districts.

DECREASE IN THE BIRTH-RATE IN 1901 AS COMPARED WITH THE MEAN BIRTH-RATE FOR 1891-1900 (given on p. 9).

	Increase	Decrease
Ancoats	...	6·23
Central	...	7·12
St. George's	...	6·56
Cheetham	...	0·17
Crumpsall	...	0·28
Blackley	...	2·61
Harpurhey	...	4·09
Moston	2·96	...
Newton Heath	...	4·75
Bradford	...	3·84
Beswick	...	5·45
Clayton	0·90	...
Ardwick	...	3·84
Openshaw	...	5·00
West Gorton	...	6·58
Rusholme	5·13	...
Chorlton-on-Medlock	...	5·97
Hulme	...	10·32

The particular districts in which the decrease is most marked are in order: Hulme, Central, West Gorton, St. George's, Ancoats, Chorlton-on-Medlock, Beswick, Openshaw, Newton, Harpurhey, Bradford, and Ardwick.

Now the order in which these occur in respect of their death-rates in the Workhouse is as follows: Central, St. George's, Ancoats, Chorlton-on-Medlock, Hulme, Ardwick, Rusholme, West Gorton, Bradford, Openshaw.

Thus, there is a general, though not a close, correspondence between death-rate in the Union and the decrease of the birth-rate. A closer correspondence could not be expected, since in any case the birth-rate in small districts undergoes large fluctuations. In the case of Rusholme there is considerable increase, due to the large number of new houses and the influx of a number of fairly well-to-do people. The same applies to Moston.

No doubt the absence of a large number of men in South Africa will account for some diminution in the birth-rate, but it would not account for the drop which actually occurred, which it has been suggested is due to the outburst of arsenical poisoning in 1900. The difference in the districts would also be accounted for in this way, since the outburst of arsenical poisoning was almost confined to the poorer classes. In fact there can be very little doubt that this is the explanation of the drop in the birth-rate for the year 1901.

As usual, the death-rate is highest in the Manchester Township, being 27·52 per 1,000, as against 21·08 in South Manchester and 17·57 in North Manchester.

In the Township the death-rate is highest in the Central, then in Ancoats, and lowest in St. George's. In North Manchester the death-rate is lowest in Cheetham, Moston, Blackley, and Crumpsall, and highest in Beswick and Bradford.

In South Manchester the death-rate is far the highest in Hulme, where it amounts to 24·33 per 1,000.

If we compare the annual death-rates of the districts with the mean annual death-rates for the ten years 1891–1900 we find that in each of the main divisions the death-rate in 1901 is below the mean, being lower in the Manchester Township by 2·56 per 1,000, in North Manchester by 0·73 per 1,000, in South Manchester by 1·24 per 1,000. Some immediate reduction in the death-rate would be caused by the drop in the birth-rate.

As regards individual sanitary districts, there is also, generally, a lower death-rate in 1901 than the average of the previous ten years. In the Manchester Township this is most marked in St. George's, though it is also well marked in the two other districts.

In North Manchester the death-rate is below the mean in Cheetham, and considerably below the mean in Blackley, Harpurhey, Newton Heath, and Bradford.

It is above the mean in Crumpsall, Moston, Beswick, and Clayton. In South Manchester the death-rate is considerably below the mean in Ardwick, Openshaw, West Gorton, Chorlton-on-Medlock, and Hulme, and considerably above the mean in Rusholme. It will be observed that in three out of four rapidly increasing districts—viz., in Rusholme, Moston, and Clayton—the death-rate has risen.

The infantile mortality, or number of deaths under 1 year per 1,000 births, is given in Table J in the Appendix.

The infantile mortality, like the general death-rate, is highest in the Manchester Township, next highest in South Manchester, and lowest in North Manchester.

In the Township the number of deaths per 1,000 births was—in the Central District 255 per 1,000, in Ancoats 234, and in St. George's 231.

In North Manchester the highest rates were 304 per 1,000 in Clayton, 203 in Beswick, 200 in Bradford, and 196 in Newton Heath.

In South Manchester the highest rates were 222 per 1,000 in Hulme, 211 in Openshaw, and 190 in West Gorton.

As usual, the illegitimate infant mortality was excessively high, being for the whole City and each of its main divisions considerably more than double the infant mortality in legitimate children. In Ancoats it was nearly three times, and in Crumpsall, Moston, West Gorton, and Rusholme it was more than three times the mortality in legitimate children.

It remains to add that the causes of death have been altered in accordance with the nosology of the College of Physicians, which has been adapted by the Registrar-General.

Table C shows the number of patients suffering from infectious diseases admitted into Monsall and Clayton during the year 1901, with the number of deaths from each disease; also the numbers sent into other hospitals with the deaths occurring in each group.

It will be noted that only one case of Smallpox was admitted into Clayton.

The number of cases of Scarlet Fever is greater than in any recent year. Still more striking is the increase in the number of cases of Diphtheria. Enteric is almost stationary, though there is a slight decrease. To make up for this, however, 32 cases of Typhus Fever were admitted in the beginning of 1901. We have not met with a case since. There is also a remarkable increase in the number of acute diseases, other than the ordinary notifiable diseases.

There are signs of a diminution in the incidence of scarlet fever, but not, so far, of Diphtheria.

Table P summarises the work of the Sanitary Department.

The death-rates of the 33 large towns, in their crude form, and as corrected for sex and age distribution, are shown in the following table, extracted from the Registrar-General's Annual Summary, for an advance copy of which I am indebted to the kindness of Dr. Tatham.

TABLE 9.—RECORDED AND CORRECTED DEATH-RATES PER 1000 PERSONS LIVING IN 33 GREAT TOWNS DURING THE YEAR 1901.

TOWNS in the order of their Corrected Average Death-rates	Standard Death-rate *	Factor for correction for Sex and Age distribution †	Recorded Death-rate, 1901	Corrected Death-rate, 1901 ‡	Comparative Mortality Figure, 1901 §
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
England and Wales	19·15	1·0000	16·90	16·90	1,000
England and Wales less the 33 Towns	19·47	0·9835	15·99	15·73	931
33 Towns	17·72	1·0806	18·59	20·09	1,189
Croydon	18·37	1·0424	12·86	13·41	793
Bristol	18·45	1·0379	15·95	16·55	979
Brighton	18·94	1·0110	16·53	16·71	989
Derby	17·36	1·1031	15·18	16·75	991
Leicester	17·64	1·0855	15·88	17·24	1,020
Plymouth	19·70	0·9720	17·89	17·39	1,029
Cardiff	17·16	1·1159	15·76	17·59	1,041
Wolverhampton	18·30	1·0464	16·89	17·67	1,046
Norwich	19·99	0·9579	18·71	17·92	1,060
Halifax	17·28	1·1082	16·39	18·16	1,075
Portsmouth	18·73	1·0224	17·85	18·25	1,080
London	17·97	1·0656	17·63	18·79	1,112
Bradford	16·81	1·1391	16·81	19·15	1,133
West Ham	17·75	1·0788	17·95	19·36	1,146
Huddersfield	16·47	1·1627	16·68	19·39	1,147
Hull	18·23	1·0504	18·62	19·56	1,157
Nottingham	17·81	1·0752	18·53	19·92	1,179
Swansea	17·53	1·0924	18·65	20·37	1,205
Birkenhead	17·42	1·0993	18·72	20·58	1,218
Bolton	16·90	1·1331	18·24	20·67	1,223
Leeds	17·28	1·1082	19·27	21·36	1,264
Burnley	16·67	1·1487	19·01	21·84	1,292
Blackburn	17·05	1·1231	19·50	21·90	1,296
Oldham	16·72	1·1453	19·64	22·49	1,331
Sunderland	18·25	1·0493	21·43	22·49	1,331
Birmingham	17·33	1·1050	20·52	22·67	1,341
Sheffield	17·22	1·1120	20·41	22·70	1,343
Gateshead	17·83	1·0740	21·59	23·19	1,372
Newcastle-upon-Tyne...	17·58	1·0892	21·89	23·84	1,411
Preston	17·42	1·0993	21·96	24·14	1,428
Salford	17·03	1·1244	21·66	24·35	1,441
Liverpool	17·44	1·0980	22·30	24·49	1,449
Manchester	16·90	1·1331	22·10	25·04	1,482

* The standard death-rate signifies the death-rate at all ages calculated on the hypothesis that the rates at each of twelve age periods in each town were the same as in England and Wales during the ten years 1881-90, the death-rate at all ages in England and Wales during that period having been 19·15 per 1000.

† The factor for correction $\left\{=\frac{19·15}{\text{Standard death-rate}}\right\}$ is the figure by which the recorded death-rate should be multiplied in order to correct for variations of sex and age distribution.

‡ The corrected death-rate is the recorded death-rate multiplied by the factor for correction.

§ The comparative mortality figure represents the corrected death-rate in each town compared with the recorded death-rate at all ages in England and Wales in 1901 taken as 1000.

It will be observed that the recorded death-rate is only exceeded by that of Liverpool. he corrected death-rate is the highest of all. I have elsewhere given reasons for not cepting the corrected death-rate unreservedly as a fair comparison, since sufficient count is not thus taken of the comparatively low mortality at school age. It is, wever, fairer than the crude death-rate.

INFECTIOUS DISEASES.

The diseases included in the Infectious Disease (Notification) Acts, 1889 and 1899, e as follows: Smallpox, Scarlet Fever, Diphtheria, Membranous Croup, Typhus Fever, nteric or Typhoid Fever, Relapsing Fever, Continued Fever, Puerperal Fever, ysipelas, and Asiatic Cholera. The following cases were notified in 1901 and in the n previous years, and the year 1901 is compared with the average of the previous ten ars. To the above diseases must be added, for the year 1901, Plague:—

	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	Aver'ge for 10 Years	1901
mallpox	2	118	607	282	51	1	...	...	2	3	107	1
carlet Fever ...	1,138	1,671	2,031	2,230	2,302	2,389	1,790	897	1,467	2,507	1,842	2,692
iphtheria...... emb. Croup	456	497	622	512	402	239	150	196	248	337	366	457
yphus Fever ...	16	6	1	...	...	1	2	...	3	*5	3	39
nteric Fever ...	761	610	618	460	493	513	503	642	381	378	536	359
elapsing Fever	4	...	...	...	...	...	...	...	...	...	...	...
uerperal Fever	55	92	93	51	33	25	49	44	35	49	53	55
rysipelas	...	...	...	...	...	...	...	...	...	177	177	318
	2,432	2,994	3,972	3,535	3,281	3,168	2,494	1,779	2,136	3,456	3,084	3,921

* There were a number of cases overlooked, and not notified, which were traced by the Medical icer of Health after the patients had recovered.

The number of deaths for eleven years from the more common diseases is shown in following table, 1901 being compared with the average:—

From	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	Aver'ge for 10 Years	1901
easles	220	369	293	222	505	567	628	271	699	254	403	292
carlet Fever ...	114	139	140	116	173	198	124	65	46	105	122	127
iphtheria...... emb. Croup	128	130	182	149	113	83	46	51	85	101	107	133
nteric Fever ...	189	124	127	91	95	118	95	120	73	75	111	75
mallpox	...	2	49	21	2	...	...	...	...	...	7	...
nfluenza	347	140	120	45	194	53	107	64	219	239	153	99
hooping Cough	518	368	240	286	250	359	299	170	227	371	309	224
	1,516	1,272	1,151	930	1,332	1,378	1,299	741	1,349	1,145	1,212	950

These tables seem to indicate that not merely Scarlet Fever, but also Enteric Fever and Diphtheria are subject to a seasonal wave, though no completed wave is shown even for Scarlet Fever.

The annual incidence of Diphtheria shows a tendency to follow the annual incidence of Scarlet Fever in its changes, which may be due to the difficulty of distinguishing between them. In spite of the great increase in Scarlet Fever in 1901, the deaths from zymotic disease were much below the average.

The history of the weekly incidence of Enteric and Scarlet Fevers in the City of Manchester, and of the deaths from Summer Diarrhœa, which was given in the form of curves for the five years ending 1895 in the Annual Report for that year, is continued in the following curves, prepared from the records by Dr. Cowie. It will be remembered that cases are given according to the dates of commencement of the attack, not the dates of notification.

These curves, taken in connection with those given in the Report for 1895, furnish a complete picture of the behaviour of these diseases for 11 years, so far as known to the Public Health Office.

It may be noted that if the figures showing the weekly incidences of a disease are written out one after the other, the first differences represent roughly the rate of increase at any time, and the second differences represent roughly the acceleration, that is to say, the aggregate forces producing fresh invasions—at the time when the number of cases in a given week were infected.

The following are observations by Dr. Cowie on the curves of weekly occurrences of Fever as they are known to us :—

ON THE CURVES OF SCARLET FEVER, ENTERIC FEVER, AND DIARRHŒA FOR THE YEARS 1896-1901.

The characteristics of the curves of incidence of these diseases, as shown in the Annual Report for 1895, are again illustrated in the curves for the past six years, here reproduced. In each of the three diseases there is a distinct annual wave showing a well-marked rise in the autumn. In Scarlet Fever the wave commences to rise from the 24th to the 35th week, ascends rapidly, and quickly reaches the apex, and falls slowly towards the end of the year. The Enteric wave rises more gradually than that of Scarlet Fever. It begins to rise from the 30th to 34th week, gradually reaches its maximum, and continues high for the remainder of the year. The chief feature of the Diarrhœa curve is the enormous rise which occurs abruptly about three weeks before the Enteric rise with unfailing regularity. The descent of the curve is as sudden as the rise. Otherwise the curve is very low and flat, and shows no special characteristics. In addition to this annual wave there is manifest, in the case of Scarlet Fever, a much longer periodic wave extending over a number of years. The trough of this wave is reached in 1898–99. It will be seen that in 1898 there is no autumnal rise in the Scarlet Fever curve. The year 1891 also showed the lowest point of this periodic wave, and here, although there was a distinct autumnal rise, it was very late, for it did not become marked until the 41st week. The length of the last periodic wave of Scarlet Fever appears to be six or seven years.

It is interesting to note that the number of cases of Scarlet Fever occurring over any period of the 11 years embraced by these curves is visible to the eye as the area contained between the base line showing the period, the ordinates drawn from its extremity, and the curve, this area being divided by the length of the base line. If equal periods are chosen, the area thus shown gives a visible measure of the number of cases of Scarlet Fever. The same is true for the cases of Enteric Fever notified, and for the deaths from Diarrhœa registered. We observe that a very severe fatality occurred from summer Diarrhœa in 1897, 1898, 1899, and 1901, but that the degree of concentration in point of time of this fatality is very various.

The curves of incidence of Scarlet Fever and of Enteric Fever are much more liable to disturbance than that of Summer Diarrhœa. The relationship between Enteric Fever and Diarrhœa is seen to be closer than that between Scarlet Fever and either of the two other diseases.

SMALLPOX.

Only one case of Smallpox occurred during the year 1901, and no death. During the present year, however, there has been a considerable outbreak in London, with extensive diffusion in the provinces. Two separate cases have occurred in Manchester: one contracted in London, and one contracted from an overlooked case on a visit from Erith in Kent. Liverpool has been invaded in a pronounced, though as yet not an alarming manner, and in turn Salford has received two cases from Liverpool.

Glasgow is another quarter from which danger threatens. Dr. Pringle, the Medical Officer of Health to the Port of Manchester, has been good enough to supply me with the addresses of all passengers from Glasgow to Manchester who have recently come under his cognizance. Some protection is afforded in this manner of a kind not to be thought lightly of, as these are mostly very poor persons.

There is, undoubtedly, a considerable risk that Manchester will be seriously attacked during either the present or next year.

What are our plans and defences against such a contingency?

It should be mentioned, at the outset, that a very large amount of revaccination has been going on in Manchester, and no doubt this would be greatly increased were Smallpox to effect a lodgment.

Vaccination and revaccination are the only reliable protections against the invasion of Smallpox. The experience of Sheffield in 1887-8, admirably investigated by the late Dr. Barry in one of his classical reports, conclusively showed that vaccination in infancy alone is inadequate to avert a severe outbreak.

The experience of Prussia appears to show that vaccination in infancy, and revaccination at the age of 12, if properly carried out, suffice to prevent a serious outbreak.

In my own experience, I have not seen any death in a vaccinated person under the age of 20. One death in a child attacked with Smallpox, it is true, I have seen. But the attack was mild, was complicated with Meningitis, and death was shown by post-mortem examination to have been due to Tubercular Meningitis. I do not remember to have seen an attack in any child under 5 years of age who has been properly vaccinated in infancy. After this age very slight attacks do occur, their number for the first few years very small, gradually increasing.

The statistics given by Dr. Gayton from the records of the Metropolitan Asylums Boards Hospitals, and the particulars ascertained by Dr. Barry for Sheffield, do not show results quite so favourable as this. But I consider that the cause of every death during an attack of Smallpox should be carefully investigated, as I cannot help thinking that all the deaths ascribed to Smallpox are not due to that disease, some of them being probably the result of intercurrent and independent disease. As an illustration, I will only mention one other death in a woman who suffered from Diarrhœa in a manner which excited my suspicion. On post-mortem examination the whole of the pelois was found to be filled with a mass of cancer which had not been previously thought of, and which was apparently the chief cause of death.

For all practical purposes we may assume that successful and adequate vaccination protects against Smallpox for at least five years, and against death for 15 years.

As far as I can see, judging from the phenomena of vaccination, the effects of successful revaccination are extensive and not intensive, that is to say, the patient starts fresh, as if he had undergone primary vaccination. If this assumption is correct, then, even with revaccination at the age of 12, the population above 20 are susceptible to Smallpox in varying degrees, at first only a few, and afterwards, say above the age of 25, a great number, being liable to attack. But in these an attack will not be fatal till a much later age, say not till the age of 27, and they are very little liable to a fatal attack up to a much later period, say up to the age of 37.

The number of persons in the population at one time liable to the disease is thus very much reduced when revaccination is compulsory.

Now a disease extends easily only when the number of susceptible persons is large, and any serious reduction in the number, whether as the result of a previous outbreak or as the result of vaccination, is a great check to its extension.

The following handbill has been prepared, and will be sent to every house in the City if Smallpox should appear to be spreading. Posters have been already put up advising revaccination, and giving the addresses of the Public Vaccinators. But a larger number would be put up if the disease should appear to be spreading :—

CITY OF MANCHESTER.

SMALLPOX.

Notice.

1.—There is reason to believe that Smallpox may appear in this City.

2.—Smallpox is an infectious disease just like Scarlet Fever, and unprotected, or incompletely protected, persons coming into the presence of a person having Smallpox, wittingly or unwittingly, are liable to be attacked.

3.—Unprotected persons are those who have never been successfully vaccinated. Doubtfully and incompletely protected persons are those who have not been successfully vaccinated for some years. All persons should be completely protected.

4.—Successful vaccination is an absolute safeguard against Smallpox for some years, the period varying with the number and size of the marks from successful vaccination, and with individual peculiarity. One small vesicle is inadequate, and should not be regarded as successful vaccination.

5.—Vaccination is quite safe when performed with proper precautions.

6.—Successful recent vaccination, or a previous attack of Smallpox, is the only adequate protection against an attack of Smallpox when there has been exposure to infection.

* 7.—Successful vaccination is a protection against attack for some years, but protects against death from Smallpox for at least 10 years.

8.—Reliance should not be placed on vaccination to protect against death from Smallpox if more than 20 years has elapsed since the last successful vaccination.

9.—A previous attack of Smallpox should not always be relied upon, as this disease is often confounded with Chickenpox. Moreover, Smallpox does occur twice in the same person, though very seldom.

10.—The percentage of deaths amongst unvaccinated persons attacked with Smallpox is very high. It is also high amongst vaccinated persons attacked with Smallpox if more than 25 years has elapsed since the last successful vaccination.

The death-rate is very low amongst vaccinated persons attacked with Smallpox if less than 20 years has elapsed since the last successful vaccination.

11.—All cases of Chickenpox should be notified by the head of the house to the Medical Officer of Health.

12.—As a rule, Chickenpox is distinguished from Smallpox by these marks: Persons (mostly children) attacked by Chickenpox are not taken ill seriously. The eruption comes out more abundantly on the body, face, and head than on the arms and legs. It comes out gradually, and the pocks are seen to be at various stages of development. Some of the pocks have a thin skin, and are filled with clear or milky fluid. They differ greatly in size, and usually itch.

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* Section 7 is the expression of personal experience. Statistics show that after successful vaccination attacks from Smallpox for some years are rare, and death from Smallpox within 10 years very rare.

13.—Mild cases of Smallpox usually begin abruptly with headache, fever, and a sense of severe illness, often with pain in the back. After two days an eruption comes out on the face, and perhaps on the arms and legs. Usually, in mild cases, there is very little eruption on the front of the body. In mild attacks, after the eruption appears, there is no longer any sense of illness. When such an illness occurs, however slight the eruption may be, a Doctor should be called in, or the case should be notified to the Medical Officer of Health by the householder.

14.—No case either of Chickenpox or Smallpox should be left without Medical attention. The slighest case of Smallpox may give rise to a fatal infection in others.

15.—You are strongly advised at the present time to protect yourselves and your family and dependents by vaccination.

16.—Vaccination may be performed either by your own Medical Attendant or by the Public Vaccinator of your district. The latter will vaccinate free of charge.

17.—Persons desiring Vaccination to be performed by the Public Vaccinator, either on themselves or on an unvaccinated child, must write to him requesting him to call at their homes, or must call at his Surgery.

18.—The names of the Public Vaccinators, with their addresses, are herewith given. Should a sufficient demand arise for the vaccination of adults in the evening, the Boards of Guardians would probably make special arrangements.

Medical Officer of Health.

NAMES AND ADDRESSES OF VACCINATION OFFICERS.

MANCHESTER UNION.

District	Vaccination Officer	Address of Vaccination Officer
Ancoats	Dr. W. T. WILLIAMS	39, Great Ancoats Street
Central	Dr. J. B. MANN	26, St. John Street
St. George's (Rochdale Road District)	Dr. J. M. S. PRESTON	120, Cheetham Hill Road

CHORLTON UNION

District	Vaccination Officer	Address of Vaccination Officer
Ardwick	Dr. JOHN WATSON	182, Stockport Road
Openshaw	Dr. E. E. JONES	818, Ashton Old Road
West Gorton (part of)	Dr. F. J. WEBB	52, Cross Lane, Gorton
West Gorton (Longsight)	Dr. H. E. H. MATTHEWS	28, Kirkmanshulme Lane
Rusholme	Dr. G. R. GOWLAND	118, Wilmslow Road
C.-on-M. (St. Luke's Ward)	Dr. W. B. PRITCHARD	272, Oxford Street
C.-on-M. (All Saints' Ward)	Dr. WM. DAVIES	25, Stretford Road
Hulme (St. George's Ward)	Dr. S. WOODCOCK	215, Chester Road
Hulme (Medlock Street Ward)	Dr. J. WILLIAMS-JONES	154, Chorlton Road

PRESTWICH UNION.

District	Vaccination Officer	Address of Vaccination Officer
Cheetham	Dr. C. F. KITCHEN	112, Cheetham Hill Road
Crumpsall	Dr. C. G. L. SKINNER	1, Church Lane, Harpurhey
Blackley		
Harpurhey		
Moston		
Newton	Dr. A. B. STEWARD	Mulberry House, Oldham Road, Newton Heath
Miles Platting	Dr. J. W. MOORE	14, Oldham Road, Miles Platting
Bradford	Dr. J. HUDSON	Ebor House, Ashton New Road, Bradford
Beswick		
Clayton	Dr. E. JOHNSTONE	North Road, Clayton
Kirkmanshulme	Dr. B. W. CONWAY	Overton House, Longsight

The City Council would be asked to declare Chickenpox a notifiable disease.

These measures are deferred, as it is felt that their effect will be comparatively slight unless Smallpox is actually in the City.

Each case is visited by the Medical Officer of Health before removal, and revaccination of persons who have been exposed to infection is, as far as possible, carried out.

Special measures will be taken in the case of common lodging-houses. On the occurrence of Smallpox in a common lodging-house, the Liverpool Sanitary Authority has recently paid the remaining inmates £1 a week each for a fortnight, on condition that they are revaccinated and remain in the lodging-house.

Sufficient precautions would be taken in regard to exposed persons going to work, and school children.

The temporary Hospital at Clayton would be rapidly extended to take a large number of cases. It has been found very difficult to get a suitable site for a Smallpox Hospital.

The Medical Officer of Health for Liverpool has lately reported to his Sanitary Authority on the subjects of Vaccination and of Smallpox, and has dealt with the subjects in a general manner.

His chief positions may be stated thus :—

1. The administration of vaccination should be transferred from the Guardians to the Sanitary Authority.

2. Additional provision should be made for facilitating revaccination, which should be compulsory in all houses or establishments in which a case of Smallpox has occurred, etc.

3. Clause 38 of the Liverpool Corporation Bill now before Parliament reads as follows :—

   "Any person who, when applied to by the Medical Officer of Health for the City, or by any Officer acting on his behalf and on his instructions, for information as to any dangerous or infectious disease, withholds any information in his possession, or knowingly gives false information, shall be liable to a penalty not exceeding forty shillings."

   The introduction, with the necessary modifications, of a clause such as this into a general Vaccination Act would be very valuable.

4. A suggestion is made to establish stations for the preparation of vaccine in some of the larger provincial centres.

5. Expresses doubts as to the propriety of the "conscientious objector" clause of the Vaccination Act of 1898.

It would certainly be an advantage to the Sanitary Authority to have the control of vaccination were it not for the possible effect on the Sanitary Authority itself. In any case, some machinery is requisite by which all vaccinations and revaccinations, with their results, shall be recorded, and copies of the records sent to the Medical Officer of Health.

When the subject of the Vaccination Bill of 1898 came under discussion in Manchester, I expressed the opinion that the results might be good on the whole.

The "conscientious objector" clause is certainly a stumbling block.

No one seems to know what a conscientious objector is. From one point of view every objector is necessarily conscientious. The value of a conscience is brought into question by this clause. Does the possession of a conscience imply the possession of common sense?

When, in common parlance, anyone is said to have a conscience, he is thereby implied to weigh things up justly. Did Parliament mean, when it created the conscientious objector, that that undefined being should show that he could and would weigh matters up, or was it intended that repugnance or mental agitation were to be synonymous with conscience?

The conscientious objector wants defining.

But I am not at all certain that the conscientious objector has been productive of harm.

Dr. Hope's recommendations 2 and 3 appear to me of value, but I am convinced that what we require before all is a Compulsory Revaccination Act at the age of 12. I should not object to the inclusion of a provision for the conscientious objector, provided always he could show his possession of a conscience.

I am not sure that it is not desirable to give a little freedom to persons who are sceptical. The effects of a Compulsory Vaccination Act would be to diminish greatly the incidence and death-rate from Smallpox, and to so increase the case in favour of vaccination that the conscientious objector would be overwhelmed by the facts. Incidentally, revaccination of all persons exposed to infection from Smallpox should be required under such conditions as would safeguard vaccination from unjust attacks.

It appears to me that what we most want is a Compulsory Revaccination Act, and that on this object we should concentrate our efforts.

THE ISOLATION OF CASES OF SCARLET FEVER IN HOSPITAL, AND OTHER MATTERS AFFECTING THIS DISEASE.

Since the year 1895, details have been furnished in the Annual Reports on the Health of Manchester respecting so-called "return" cases of Scarlet Fever, and in that year a plan was marked out by which the occurrence of such cases could be avoided. It was clearly recognised that these cases must of necessity tend to maintain the presence of the disease in the localities to which they belonged. A case known to be in the infective stage of Scarlet Fever ceases to be dangerous to children outside the home, as a rule. But overlooked cases, and cases returned from hospital in an infective condition, mix freely with persons outside, and are in a position to do much greater harm.

Moreover, overlooked cases are often at home during their most infectious period, but cases discharged from the hospital in this condition are usually at once sent to school.

Apart from this factor, it seemed certain that isolation in hospital must very much limit infection.

It appeared, therefore, of very great importance to remove, if possible, this source of infection. In dealing with the question, it was necessary to start from firm ground.

It was first shown that the connection between "return" cases and discharged cases is one which relates purely to the hospital. That is to say, cases do not occur at home at similar intervals after the occurrence of the first case (with rare exceptions), even when there is abundance of susceptible material.

It was then proved that the "return" cases are due to the discharged cases.

The phenomenon, then, being one peculiar to cases discharged from the hospital it became a matter for inquiry to what peculiar influence in the hospital it was due.

It was shown that the duration of stay in the hospital had little or no effect upon it. Cases discharged from the hospital are clad in disinfected materials, and their skin is cleansed immediately before discharge. In these respects they must compare favourably with cases discharged at home.

Where, then, is the infection stored? A little reflection showed that this must be in the nostrils, though accumulation to a much slighter extent may take place in the throat and ears, and that it is due to the admixture of recent and convalescent cases. In breathing the atmosphere of the ward charged with recent and active infection, the infective particles are entangled in the mucous membrane of the nose, and there form accumulations of infective germs, to be discharged at varying periods after the patient has returned home.

It is to be expected that such accumulations will frequently cause some amount of Rhinitis, and, in fact, I was informed by Dr. Marsden that on directing his attention specially to the point he had found Rhinitis very common.

But it will also be seen from my detailed records that in a considerable number of return cases the infecting person did not suffer from Rhinitis.

Indeed I regard the supposed connection between nasal discharge and the continuance of infectivity as probably imaginary, and, in any case, as entirely secondary. The infection is, in my opinion, due to accumulation of infection from without, and does not come from the body of the convalescent child.

With the exception of this last position, Professor Simpson's conclusions, as the result of an elaborate inquiry, entirely coincide with those at which I had arrived.

Moreover, his conclusions as to what is needful are very much the same. These are, that children must be isolated in a convalescent ward for a sufficient period before discharge. Such a period cannot be placed at less than ten days, and should be a fortnight. Their nasal cavities should be washed out daily with an antiseptic. The material which I used, however, apparently with success, was permanganate of potash.

Their skins were inuncted all over with a 2·5 per cent. carbolic oil every two days, directly after a bath, and finally they were taken out whenever possible to play outside. While this course of action was carried out "return" cases practically ceased.

It is an important question when children should be sent into the convalescent ward. It has been customary in Monsall Hospital to discharge the cases at the end of 8 weeks. This long period was, I understand, adopted on account of the occurrence of return cases, which, however, it failed to prevent. It may be safely said, however, that children should not be sent over to the convalescent wards until, except for extraneous infectious matter, they have ceased to be infectious, say not till 4 or 5 weeks have elapsed.

In sending them over, it is important that they should reach the convalescent ward as free from infection as possible. They should, therefore, be inuncted just before being sent over, and their nostrils should be washed out about the same time. It is advisable also, at this time, when possible, to wash the ears and mouth.

It cannot be supposed that the ears will receive much infection. Nevertheless, it is well to wash these out also.

Such were the conclusions arrived at in 1895 from a consideration of the facts available, and I see no reason to modify these conclusions, nor to doubt that, with a careful technique, patients can be almost always sent out of hospital free from liability to infect.

Professor Simpson, commenting on the phenomenon of "return" cases, calls attention to the likelihood that the value of hospital isolation for Scarlet Fever will be called in question.

That is scarcely a prophecy, as Dr. Marriott, of Nottingham, had already made an attack on the removal of cases to hospital. But Dr. G. Killick Millard, in his communication to the Epidemiological Society, naturally uses this remark as a forerunner of his inquiries.

These do not concern themselves simply with the question of return cases, but are addressed to the larger issue, whether hospital isolation for Scarlet Fever is justified by its results.

He has collected the statistics of Scarlet Fever incidence and mortality, with the proportion of cases treated in hospital from a large number of towns, for as long a period as records are available. From these materials, skilfully handled, he has arrived at the conclusion that hospital isolation for Scarlet Fever has not been justified.

In attempting to explain what he believes to be the failure of what looks like a promising measure, he has taken "return" cases as one of the large factors which have diminished the value of hospital isolation, and, I think, justly.

It has, however, been urged against his mode of reasoning that he has compared towns for limited periods, while the wave of Scarlet Fever prevalence is of considerable, if variable, duration, and that the periods of time used are inadequate.

What might also be said is that the actual facts recorded, and on which the results are based, are liable to vary according to the degree of administrative attention given to the disease, and I should be inclined to think that this would probably be the larger source of error of the two.

It thus becomes requisite to attack the question from the side of internal evidence.

I have, therefore, used the singularly complete facts available in Manchester to elucidate in some manner this rather complicated question.

This I am able to do by reason of the very complete forms of inquiry into these cases devised by Dr. Tatham.

Every inquiry form gives the age and sex of every member of the household in which a case has occurred, and whether such person has or has not had Scarlet Fever, the rent paid for the house, and the number of rooms.

Of these I have used the rent of the house to determine the circumstances of households from which persons have been removed, or not removed, and it thus appears that the former are a much poorer class.

For each primary case in a household, I have jotted down the number of persons remaining under 15 who have not had Scarlet Fever, and the total number remaining. This has been done separately for cases removed to hospital, cases treated at home, and overlooked cases.

The number of households subsequently attacked has been recorded, and the number of subsequent cases, according as they have been attacked within 8 days, 14 days, 21, 31, 41 days, or upwards, in the case of removal to the hospital, after removal of the first case, otherwise, after the eruption in the first case. There is very little interval between the eruption and removal as a rule.

In this way it becomes possible to compare the susceptible material left at home on removal of the primary case to hospital or otherwise, and it becomes at once obvious that, where the patient is not removed to hospital, there is, on the average, much less susceptible material left at home.

This classification also permits us to see how much infection has occurred at home which removal to hospital cannot prevent. Incidentally we learn something of the period at which the disease is most infectious, as we shall see.

But, in addition, it enables us to judge what degree of protection is afforded by removal to hospital against the subsequent occurrence of Scarlet Fever at home.

Finally, I will come to the subject of "return" cases, and to other matters relating to late infections.

First, then, with regard to the circumstances of persons removed to hospital and of persons treated at home respectively, no apology is needed for considering this subject carefully and laboriously, as the danger of infection at home will depend largely on the possibility of isolation and on the intelligence of the head of the household. Moreover, a simple question such as this furnishes an opportunity of considering how we may determine when our facts are adequate for a secure conclusion without having recourse to mathematics.

The circumstances of cases removed to hospital and treated at home.

Taking, then, the Fever Cards for 1901, I extracted for each primary case removed to hospital the rent of the house up to the number of 996, not going beyond 13/- per week. The number is not 1,000, simply because four were recorded exceeding 13/- per week, but this in no way affects the averages.

These facts were arranged primarily in groups of 50, and where an excess over 13 was discovered, so that 50 was reduced, say, to 49, the average was taken on 49. With very rare exceptions the rents ascend by threepence at a time, and where they do not they are put into the nearest rent.

If, now, we take the arithmetical averages of successive groups of 50, we find that these are, in order :—

	s.	d.		s.	d.
(1)—	5	4·5	(11)—	5	9·1
(2)—	6	2·9	(12)—	6	0·8
(3)—	5	11·2	(13)—	5	8·8
(4)—	5	5·8	(14)—	6	1·7
(5)—	5	4·5	(15)—	6	1·1
(6)—	5	9·7	(16)—	5	11·7
(7)—	5	11·9	(17)—	5	8·8
(8)—	5	9·6	(18)—	5	3·3
(9)—	5	8·1	(19)—	5	8·8
(10)—	5	11	(20)—	6	1·2

The variation here is considerable, amounting to 11·6d.

If, however, we take successive groups of 250, the averages are :—

s.	d.	s.	d.	s.	d.	s.	d.
5	9·58	5	9·86	5	11·5	5	11·94

Here the variation is 2·36d.

The average of successive 500 is :—

s.	d.	s.	d.
5	9·82	5	10·32

Difference 0·43d.

Total average ... ... 5s. 10·06d.

But we are at liberty to compare any successive 500. The average of successive 500 are :—

s.	d.	s.	d.
5	9·82	5	10·98
5	9·59	5	10·67
5	9·38	5	10·03
5	9·14	5	10·11
5	9·93	5	10·32
5	10·78		

The variation here is 1·84d.

If, now, we take the average of successive fifties of the cases treated at home, omitting rents over 13s., we find that they are

s.	d.	s.	d.
7	1·96	6	8·19
6	3·72	6	9·61
7	5·41	6	3·42

It is unnecessary to proceed further, as the lowest of these averages is above the highest average of 50 in the previous reckoning, and it is manifest that the difference is considerable in the average rents of the houses sending cases to hospital and those keeping the children at home.

For the purpose of this investigation it will be seen that an average of 250 suffices.

The average of 1,000 treated at hospital is 5s. 10·06d., of 250 treated at home is 6s. 10·58d., and if we allow for a difference of 2d. from the average of a large number, there is still a difference of 10d. on the average house.

But the circumstances of the houses are better exhibited in the following manner, suggested by Professor Bowley's treatise on "Statistics."

The rents are entered in a table of successive threepences from 2s. per week to 13s. per week, the rents (comparatively few) which are not at any threepence being entered to the nearest threepence.

This is done first for primary cases removed to hospital in 1901 and secondly for primary cases not removed to hospital. But in the latter table, as one year would not furnish a sufficient number of cases, previous years are drawn upon.

It will be at once seen how differently the rents are distributed for the two groups.

Those for cases treated at home are much more scattered at the higher sums than are those for cases removed to hospital.

The median, that is, the rent at which there are as many above as below it, is considerably higher for cases treated at home.

The mode or the point at which the rents cluster most densely is also higher.

The table shows successive groups of fifties as with the case of the arithmetical averages and with the same object in view.

From the above table we perceive that the median point is at 5s. 3d., the upper quartile at 6s. 6d., and the lower quartile at 4s. 6d.

The mode or point of greatest density is 5s.

We have, then, to determine whether we have enough figures to determine that the differences between the median and the mode of those treated at home and of those treated at hospital may be accepted as a sufficient representation of the facts, and are unlikely to be materially altered by other figures.

I will **first** give the tables showing the distribution of rents for primary cases treated in the hospital to the number of 1000 :—

RENTS OF HOUSES HAVING PRIMARY CASES OF SCARLET FEVER TREATED IN HOSPITAL IN SUCCESSIVE GROUPS OF 50.

Groups.

RENTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTALS
13/- and upwards	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	4
9d.	...	1	...	...	...	1	...	...	...	2	...	1	1	...	...	1	...	...	...	...	7
6d.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3d.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12/-	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9d.	..	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2
6d.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
3d.	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	3
11/-	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1
9d.	1	...	1	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...	...	1	6
6d.	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1
3d.	...	...	...	1	...	1	...	...	...	...	2	...	..	1	1	...	1	1	1	...	9
10/-	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
9d.	...	2	2	...	1	...	1	...	2		...	...	...	...	1	...	...	1	...	2	12
6d.	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	3
3d.	1	1	...	...	1	...	1	1	...	...	1	...	2	...	...	1	2	...	1	...	12
9/-	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9d.	2	...	2	...	...	...	1	1	2	1	1	1	1	1	3	1	2	...	1	1	21
6d.	...	...	...	...	...	...	...	1	...	...	...	...	...	1	2	1	2	...	...	...	7
3d.	...	2	2	...	...	1	1	1	...	2	...	3	1	2	...	1	2	...	3	1	22
8/-	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	1	4

Rents of Houses having Primary Cases of Scarlet Fever Treated in Hospital in Successive Groups of 50—*continued.—Groups.*

Rents	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Totals
9d.	2	1	1	2	1	1	3	4	...	...	1	3	...	2	1	2	1	...	...	1	26
6d.	...	1	...	...	1	...	...	...	...	1	1	2	...	...	1	...	1	...	...	...	8
3d.	1	1	1	3	...	1	3	1	...	3	1	1	4	4	1	1	...	2	2	5	35
7/-	1	...	1	...	1	1	1	3	2	1	...	1	1	...	...	...	...	...	...	...	13
9d.	4	3	2	1	1	1	2	1	4	1	4	1	1	...	...	5	...	2	...	2	35
6d.	1	3	...	...	1	...	1	...	...	...	...	1	...	...	...	1	1	...	...	...	9
3d.	2	...	3	1	...	2	...	2	...	...	4	1	...	2	...	1	1	1	1	...	21
6/-	1	4	2	3	2	4	8	1	1	6	1	2	2	3	1	2	...	4	10	8	65
9d.	3	3	2	4	1	1	2	5	3	4	2	3	2	3	8	1	3	1	...	1	52
6d.	1	2	2	1	3	4	1	...	4	...	2	4	2	4	...	2	2	...	...	1	35
3d.	5	2	2	3	1	6	3	2	3	3	3	7	5	5	4	3	1	3	6	3	70
5/-	4	3	5	2	6	6	1	2	2	5	2	2	4	1	3	3	1	6	2	2	62
9d.	5	5	5	3	2	5	3	10	8	5	7	6	4	6	11	7	3	3	3	3	104
6d.	5	5	6	8	11	5	4	3	3	3	5	1	4	...	4	5	9	5	5	4	95
3d.	2	3	6	7	8	5	3	4	9	2	3	3	4	6	7	5	11	11	5	6	110
4/-	4	2	1	3	3	1	5	4	3	2	6	4	2	1	...	2	4	5	3	2	57
9d.	2	1	1	2	...	...	4	1	1	4	2	1	4	2	...	1	...	2	1	2	31
6d.	...	2	...	2	2	1	...	...	...	2	...	1	2	...	...	1	...	...	1	1	15
3d.	1	1	3	1	3	2	...	1	...	1	2	1	3	2	...	...	...	...	2	...	23
3/-	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	1	...	...	1	1	6
9d.	...	...	...	...	...	...	...	1		1	...	...	...	1	1	1	...	1	...	...	6
6d.	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	3
3d.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	2
2/-	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1

Taking successive groups of 250 from the above table, the numbers on the left-hand side indicating shillings of rent, and the numbers in columns 2, 3, 4, 5 being the numbers of households paying these rents, we find that the median point stands in three out of the four instances at 5s. 3d., and in the fourth very close to it.

The principal mode is somewhat more variable.

The following tables show the distribution of rents in the primary cases treated at home to the number of 800 :—

RENTS OF HOUSES HAVING PRIMARY CASES OF SCARLET FEVER TREATED AT HOME IN SUCCESSIVE GROUPS OF 50.

Groups.

RENTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TOTALS
13/– and upwards	2	1	4	1	5	2	2	5	5	3	1	3	...	3	3	3	43
9d.	1	...	1	1	2	...	1	2	...	...	...	1	1	...	...	2	12
6d.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3d.	1	1	...	1	1	1	...	...	1	...	...	...	1	...	...	...	7
12/–	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9d.	...	2	...	...	1	...	1	...	1	2	1	2	...	...	1	...	11
6d.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3d.	1	...	1	...	...	...	...	...	...	1	...	1	...	1	...	2	7
11/–	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9d.	...	...	1	...	...	2	1	...	1	3	...	1	1	...	2	...	12
6d.	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
3d.	1	...	...	...	...	1	...	1	1	1	2	...	...	1	1	1	10
10/–	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1
9d.	1	...	1	...	1	...	2	1	3	3	3	1	3	4	1	3	27
6d.	...	...	1	...	1	1	...	1	1	...	...	...	...	1	...	...	6
3d.	1	1	2	1	...	...	1	1	1	2	...	2	2	2	3	1	20
9/–	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	2
9d.	1	3	2	1	...	1	2	1	3	1	3	1	2	2	1	1	25
6d.	1	..	1	1	...	...	3	...	...	...	...	1	...	...	...	2	9
3d.	4	...	3	3	1	2	1	1	2	...	1	3	1	...	3	...	25
8/–	1	...	...	1	...	1	...	1	3	...	1	...	...	...	...	...	8

Rents of Houses having Primary Cases of Scarlet Fever Treated at Home in Successive Groups of 50—*continued.*

Groups.

Rents	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Totals
9d.	2	1	2	5	1	1	3	3	1	1	4	5	3	2	5	1	40
6d.	3	...	...	4	5	1	...	...	2	1	...	...	...	...	...	...	16
3d.	4	5	1	2	2	2	2	3	1	2	2	3	1	2	1	3	36
7/-	...	1	1	1	...	...	1	...	2	2	2	...	...	...	1	...	11
9d.	2	2	3	2	1	3	3	2	1	...	...	5	3	3	...	2	32
6d.	2	1	...	2	...	...	2	1	...	...	1	1	...	...	2	...	12
3d.	...	...	...	...	1	1	...	1	...	...	2	1	1	1	1	1	10
6/-	2	6	5	2	6	4	3	2	3	2	3	4	6	3	3	4	58
9d.	3	...	3	3	1	2	2	3	2	3	3	2	2	2	3	1	35
6d.	4	5	1	2	3	5	1	3	...	2	...	1	2	1	1	...	31
3d.	2	2	3	3	3	4	2	6	3	4	8	3	2	1	...	4	50
5/-	1	1	4	3	5	3	2	1	1	4	...	1	2	3	2	5	38
9d.	...	4	4	1	2	1	3	5	3	5	1	2	5	6	3	3	48
6d.	3	4	1	1	1	4	3	1	6	2	4	1	3	4	5	4	47
3d.	1	5	4	5	2	2	3	1	2	3	4	...	3	1	4	4	44
4/-	3	...	...	2	3	3	3	1	...	2	2	2	2	4	1	2	30
9d.	1	3	...	1	1	...	1	...	...	...	...	3	2	1	1	1	15
6d.	1	...	...	...	...	2	...	...	1	...	1	...	...	...	...	...	5
3d.	...	...	...	...	...	1	1	2	...	1	...	...	1	2	2	...	10
3/-	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	2
9d.	...	1	...	...	...	...	...	1	...	...	1	...	...	..	...	...	3
6d.	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	..	1
3d.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2/-	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

It will be noted that the rents are much more scattered in these than in the previous tables.

If, now, we take successive groups of 250, from which rents over 13s. have been omitted, we find that for each of the three the median point is 6s. 3d., while the principal mode is somewhat indefinite. Hence the figures are adequate to determine the median point, which stands 1s. a week higher for cases treated at home than for cases treated in hospital.

The wider scattering of the home figures is succinctly shown thus, the upper quartile being the point above which lie one quarter of the rents, the lower quartile the point below which lie one quarter of the rents :—

	Rents for primary cases removed to Hospital.		Rents for primary cases treated at home.	
	s.	d.	s.	d.
Upper quartile	6	6	8	0
Median	5	3	6	3
Lower quartile	4	6	5	0

It may seem that this point has been unduly laboured, and that an unnecessary amount of toil has been bestowed upon it. In determining, however, the facts on which we are to base our opinions, accuracy is absolutely essential.

It is no less essential to have some method by which, in a simple manner, we may assess the adequacy of our facts to bear the stress of a precise conclusion. It is on this account that the reasoning is so fully given.

It might have been expected that with the shifting incidence of Scarlet Fever in different years on poorer or richer districts, the position of the median point would have altered in the cases treated at home. It appears, however, that the relations are more stable than might have been anticipated. The subject may be investigated from the number of rooms occupied. But the above method enables us to obtain a more extended view of the circumstances in households affected with Scarlet Fever.

ANALYSIS OF THE FACTS RELATING TO CASES TREATED IN THE HOSPITAL AND AT HOME.

This analysis is the most important part of this inquiry, and rests on the following tables, which I here insert :—

Cases Treated in Hospital.

Number of primary cases occurring at home, removed to Monsall, in successive groups	Number of susceptible persons under 15 years of age left in the house	Total number left	House-holds having subsequent cases	Number of subsequent cases	Number of subsequent cases occurring within — days of removal of first case						Return cases at home	
					Within 8 days	— 14	— 21	— 31	— 41	42 and upwards	Within 21 days after discharge	21 days and upwards
1900 87	165	458	10	15	13	1	0	0	0	0	1	...
209	372	1,015	28	46	33	4	3	1	1	0	4	...
221	422	1,109	37	73	51	9	2	0	1	1	9	...
200	366	1,001	25	30	27	0	1	1	0	0	1	...
TOTAL 1900 717	1,325	3,583	100	164	124	14	6	2	2	1	15	...
1901 200	409	993	46	59	36	5	1	0	1	0	13	4
150	316	818	41	60	29	5	6	4	1	2	6	6
200	344	990	38	58	41	3	0	2	1	1	9	0
200	364	995	30	43	29	7	1	0	0	1	3	5
Beginning July 2nd ...200	361	987	46	53	40	3	2	0	0	0	5	3
200	418	1,050	43	53	31	1	3	1	0	1	10	6
200	410	1,066	46	62	28	4	3	4	2	1	11	7
184	315	914	44	74	45	5	1	1	1	2	11	7
TOTAL IN 1901 1,534	2,937	7,813	334	462	279	33	17	12	6	8	68	38
											106	

Cases Treated at Home.

Number of primary cases treated at home	Susceptible persons under 15 years of age left at home	Total number left	Number of households in which subsequent cases occurred	Number of subsequent cases	Number of cases occurring within 8 days, from 9 to 14, 15 to 21, 22 to 31, 32 to 41, 42 days and upwards after the eruption appeared in the first case					
					Within 8 days	— 14	— 21	— 31	— 41	42 and upwards
1900.......... 107	117	473	10	...	7	1	2	1	...	1
68	50	263	6	...	7	...	...	...	...	1
57	46	231	6	...	5	...	1	2	...	...
TOTAL 1900... 232	213	967	22	28	19	1	3	3	0	2
1901.......... 200	195	846	33	44	37	4	1	2	...	0
128	132	500	15	17	9	5	1	1	1	...
30	24	138	4	8	6	...	1	1	...	0
TOTAL 1901... 358	351	1484	52	69	52	9	3	4	1	0

CASES OVERLOOKED.

Primary cases overlooked	Susceptible persons under 15 years of age left at home	Total number left	Number of households in which subsequent cases occurred	Number of subsequent cases	Intervals at which subsequent cases occurred after the last case					
					Within 8 days	— 14	— 21	— 31	— 41	42 and upwards
1900— 77	155	330	35	59	30	12	5	10	2	...
1901— 76	163	395	54	83	47	22	10	4	...	...
33	60	169	13	17	10	4	2	...	...	1
Total 1901— 109	223	564	67	100	57	26	12	4	...	1

SUMMARY FOR 1901.

Primary cases removed to hospital	Susceptible persons under 15 remaining	Total number left	Households subsequently attacked	Number of subsequent cases	Number occurring within — days of removal to Hospital, or within — days of first case when left at home						Return cases at home	
					— 8 days	— 14	— 21	— 31	— 41	42 and upwards	Up to 21 days after discharge	21 days and upwards
1534	2937	7813	334	462	279	33	17	12	6	8	68	38
											106	
Primary cases recognised, but treated at home: 358	351	1484	52	69	52	9	3	4	1	0		
Primary cases overlooked: 109	223	564	67	100	57	26	12	4	0	1		

The compilation of such tables is possible owing to the fact that when a case of Scarlet Fever occurs in a household a record is kept showing, amongst other particulars, the age of the remaining members of the household, and whether each of them has had Scarlet Fever. In the tables the number of susceptible persons under 15 years of age only is given because it is believed that, almost invariably, the members of a household may be relied upon to remember up to this age whether there has or has not been an attack of Scarlatina in the individual.

Each inspector's sheet has not only been scrutinised when made, but has subsequently been carefully read, and those cases have been discriminated which have apparently not contracted their disease at home, these being subdivided into cases early removed to the hospital; cases recognised, but treated at home; and not recognised, whether subsequently removed to the hospital or not.

For each case is taken out the number of susceptible persons left in the house, the total cases left, and subsequent attacks occurring in the same house at intervals after removal to the hospital of the first case; or for persons treated at home at intervals after the beginning of the first attack of 0 to 8 days, 9 to 14 days, 15 to 21 days, 22 to 31 days, and so on.

When more than one subsequent case occurs, the intervals recorded are in all cases between the case infecting and the case infected. Frequently, however, subsequent cases are clustered about the first case.

The particulars are taken out in successive groups with a view to apply the method already described, should it prove applicable, to see how far we must go before we can place much confidence in the results.

Particulars are given for two successive years, 1900 and 1901. But the facts relating to return cases in 1900 are recorded only when the interval between discharge and the subsequent occurrence of a case does not exceed 21 days. There were, however, not nearly so many return cases in 1900 as in 1901. In other respects the facts are in close agreement for the two years. At the same time there was not the same strict censorship exercised over the returns in 1900 as in 1901, and I propose, therefore, to lay chief stress on the figures for 1901 alone.

No limit is placed to the period at which a discharged case may infect for reasons already given, but cases occurring up to the end of the 21st day after the discharge from hospital of the first case are given separately from those occurring afterwards.

We may first consider what these tables can tell us at a mere glance.

We are struck at once with the immense potency for infection of overlooked cases, which are for the most part very slight, and many of them such that they could not be easily diagnosed by a medical expert.

If we compare successive groups of primary recognised cases with the number of susceptible persons left at home, and the total numbers left at home, we perceive that susceptible persons bear a comparatively small proportion to first cases in those households in which the patient is kept at home. The proportion of total persons left at home is also smaller, but not to anything like the same extent. The examination of the papers shows, for cases kept at home, a relatively large number of young married people with one infant, or of households all the rest of the young people in which had previously had Scarlet Fever.

We thus see that not only are the patients in hospital, on the average, removed from homes poorer than those in which the patient is kept at home, and, therefore, more crowded, but that, in addition, the numbers present in the former homes are considerably greater, while the proportion of susceptible persons under 15 years of age is about double.

These figures, therefore, form a strong *a priori* case for the utility of the Isolation Hospital.

In the case of overlooked attacks, the proportion of susceptible remaining persons and of total remaining persons is even greater than in households from which the first cases are removed.

If, now, we take only the table relating to cases removed to the hospital, we perceive that there is a fair degree of uniformity in respect of the proportion of susceptible and of total cases left at home, but there is no such uniformity in regard to the proportion of subsequent attacks, nor in respect of the distribution of the subsequent attacks. There is even less correspondence in the number of return cases.

In fact, at least a year is required as a unit of comparison. Return cases are, as we perceive at a glance, most numerous when the cases are most thickly aggregated. The 5th horizontal line in 1901 begins with July, and the return cases increase rapidly with the autumnal ascent of incidence, and, no doubt, in consequence.

The incidence of cases also occurring after the immediate influence of the patient is removed varies greatly, being in the year 1901 greatest in Spring and Autumn.

Hence, only after the accumulation of similar materials for years can we draw anything like absolute conclusions from the facts tabulated in this manner. I am permitted, however, to say that Dr. C. H. Tattersall, of Salford, has examined with great care the individual facts for 3 years, and that the results of his tabulation of these agrees with mine.

In a comparison of the results of overlooked cases at home with those of cases removed to the hospital, or treated at home but recognised, it is necessary to point out that there are no doubt other overlooked cases of which we learn nothing, and that those which we have to deal with are selected largely by the fact that subsequent cases have occurred and have called attention to them. Unless this be borne in mind, exaggerated conclusions might easily be drawn.

Having thus shown the limitations attaching to these figures, I will now treat them as if we could rely upon them as showing the facts for other years than those considered. Taking, then, first the figures given in the tables for 1901, let us determine the total subsequent rate of incidence, including return cases ; upon the susceptible persons left under 15 years of age, for cases removed to the hospital, for cases recognised but treated at home, and for unrecognised cases.

In calculating these rates upon the susceptible material left at home, we are assuming that no change is occurring in the susceptible material by previous subsequent cases. But this is not so. If, on the other hand, we subtract from the susceptible persons all other subsequent cases except those at the particular period under consideration, we get too few susceptible persons at that period.

The rates of incidence in the first case will be too low, and in the second instance too high, and the true rates will lie between. I will call the rates of subsequent incidence on the susceptible persons regarded as unchanging, and obtained as above, A and B, the lower and upper limits respectively.

We then have :—

The Rates per 1,000 on Susceptible Persons under 15 years of age of subsequent cases after removal to Hospital of the primary case — days after removal.

Total subsequent incidence		Up to 8 days after removal	—14	—21	—31	—41	42 and upwards	Return Cases
A......	157·0	95·00	11·24	5·79	4·09	2·04	2·72	36·09
B......	157·0	101·27	13·15	6·82	4·82	2·41	3·22	40·90

The Rates per 1,000 on Susceptible Persons under 15 years of age of subsequent cases when the primary cases have been treated at home — days after eruption in the first case.

Total subsequent incidence		Up to 8 days	—14	—21	—31	—41	42 and upwards
A......	196·6	148·1	25·64	8 55	11·40	2·85	0
B......	196·6	155·7	30·93	10·53	13·99	3·53	0

The same figures for overlooked cases :—

Total subsequent incidence		Up to 8 days	—14	—21	—31	—41	42 and upwards
A	448·4	255·6	116·59	53·81	17·94	0	4·48
B	448·4	316·7	174·50	88·89	31·50	0	8·06

The figures will not be materially altered if the year 1900 is included, except that the incidence of return cases will be lowered.

Now, in comparing these three groups of cases, we see that there is a very great advantage on the side of the hospital within 8 days of removal as compared with cases treated at home within 8 days of an attack, and this in spite of the fact that the 8 days after removal probably covers 10 days after the eruption, on an average. It may be said that these cases should be excluded from the comparison, as they would have happened in any case. But no observation could be more fallacious. It can scarcely be doubted that if the hospital cases had been kept at home the proportion of subsequent cases within 8 days of the attack would, at least, have reached the figure attained when cases are actually treated at home. The latent period of

Scarlet Fever varies from 1 to 7 or 8 days. Hence, any advantage on the side of the hospital at this period may safely be ascribed to early isolation. It is true that, if this figure be excluded, the incidence rate of subsequent cases at home plus return cases, in hospital cases, exceeds the incidence rate for cases treated at home.

Even then, if we consider the homes from which the two classes of patients come, the advantage would be greatly in favour of isolation.

But to treat the figures in this manner is entirely inadmissible, and the proper comparison is between total rates of subsequent incidence.

The actual advantage thus shown is only 39 per 1,000 of susceptible persons or say 110 cases on a total of 2,000. This is not the real saving, however. Besides the protection to institutions, the circumstances of those whose children are isolated are, on the average, such that the protection afforded must be very great.

All this is on the supposition that one year in Manchester and three in Salford are a sufficient basis. We have seen the limitations existing to a positive conclusion.

POSSIBLE EXPLANATIONS OF SUBSEQUENT CASES OTHER THAN DIRECT INFECTION.

Having regard, now, to the Table on page 54, we perceive that there is a reduction in the number of return cases at those periods of the year, which coincide with a diminution in the number of cases sent into the hospital, on which fact it is no doubt dependent.

Does the table throw any light on the cause of the annual wave of Scarlet Fever? I have suggested that there is a soil factor producing this increase, and that it probably owns a similar cause to the autumnal increase of Typhoid Fever.

Two explanations are available. Either the disease, for some reason or another, takes on an increased infectivity at that season of the year at which the curve begins to ascend, or it is spread by some influence outside the household, such as a growth of the infecting organism in the soil. In either case, season influences are at work.

Now if the disease takes on an increased power of infection, this should be manifested in an increase of the number of subsequent cases within 8 days or 10 days of the first case, in proportion to the susceptible material presented in infected households. It is unsafe to travel outside this limit, because if there is any other influence at work it will have time to assert itself.

If, now, we look in the period following July 2nd, when the cases are increasing, at the proportion of subsequent cases occurring within eight days of removal to the number of susceptible cases remaining in the household, no such increase of infectivity is apparent, but the reverse. What does appear to manifest itself is an increase in the number of susceptible persons left in the household. This is susceptible of the interpretation that during the period when Scarlet Fever diminishes the infectious elements of the disease are more circumscribed, while the ascent of the curve corresponds with a diffused infection, which selects, as a mere matter of chance, the families with most susceptible persons in them.

As regards the occurrence of subsequent cases delayed beyond eight days after removal of the first case, when these increase we have various possible causes, such as defective disinfection, increase of slight overlooked cases, growth in the soil near the house, multiple infection from some common source, such as an infected school, infection from the hospital by visitors, &c.

As regards defective disinfection, were this the cause these cases should be proportionately most numerous when the cases are most numerous, and when the work, therefore, has to be most quickly despatched.

This does not appear to be the case, and though no doubt delay or inadequacy of disinfection is responsible for a portion of these cases, it is not sufficient to account for the marked inequalities observed.

Were an increase in these cases due to an increase in slight overlooked cases, we should expect that the whole type of the disease would then be milder, and, consequently, that the mortality rate would be reduced.

If they were dependent on growth in the soil their increase should correspond with the autumnal ascent of the Scarlet Fever curve. This is the case so far as 1901 is concerned. But, on the other hand, there is a marked outburst of these cases in the earlier part of the year. Moreover, there should be other means of determining this factor if existent.

Not only so, but there should be, at this time, an increase in the number of subsequent cases in houses separated by considerable intervals from previous cases.

As regards infection from the same focus of infection as a previous case, such as an infected school, this also admits of special investigation.

It will be clear, however, that these various lines of inquiry demand much patience, and have only an indirect bearing on the principal question, which is itself by no means an easy one. Unless they can be pursued without too much labour, it is questionable whether the results would be worth the pains bestowed on them.

At all events, to overtake an investigation so extensive requires much time, labour, and thought, and it is necessary, in the meantime, to restrict the area of inquiry.

ON RETURN CASES.

The following table contains the details usually given for return cases.

I am indebted to Dr. Gordon for the statement of the complications occurring in hospital.

Prog. No. of second case	Date of Eruption of second case	Prog. No. of first case	Date of Notification of first case	Date of Eruption of first case	Date of removal to Hospital	Date of return home	Interval between return and eruption in second case	No. of days in Hospital, first case	Contracted at		Complications of first case during stay in Hospital	Condition of first case when discharged as stated by the relatives	District
									Home	Another House			
							(Days)						
31	Jan. 1	2102	Nov. 5	Nov. 3	Nov. 5	Dec. 28	4	54			Nil	?	Newton
65	Jan. 3	2004	Oct. 27	Oct. 23	Oct. 27	Dec. 21	13	56			Nil	Sore nose and mouth	Moston
79	Jan. 6	1854	Oct. 11	Oct. 9	Oct. 11	Nov. 30	37	51			Adenitis	Nothing observed	Beswick
90 91	Jan. 9	2107	Nov. 6	Nov. 3	Nov. 6	Jan. 4	5	60			Otitis (double)	Discharge from ears	Harpurhey
105	Jan. 11	1855	Oct. 11	Oct. 10	Oct. 11	Dec. 21	21	72			Otitis, Rhinitis, Nephritis	Discharge from ears	Ardwick
116	Jan. 14	2128	Nov. 9	Nov. 7	Nov. 9	Jan. 1	13	54		+		Slight discharge from nose	Cheetham
134	Jan. 11	1728	Sept. 26	Sept. 24	Sept. 27	Nov. 16	56	51				?	Hulme
148	Jan. 16	2105	Nov. 5	Nov. 4	Nov. 5	Jan. 11	5	68			Rhinitis	?	Ardwick
169	Jan. 19	2012	Oct. 29	Oct. 27	Oct. 29	Jan. 1	18	65			Rhinitis	?	Central
173	Jan. 20	2128	Nov. 9	Nov. 7	Nov. 9	Jan. 1	19	54			Nil	?	Cheetham
178	Jan. 18	2107	Nov. 6	Nov. 3	Nov. 6	Jan. 4	14	60		+	Otitis (double)	?	Harpurhey
186	Jan. 21	2216	Nov. 19	Nov. 17	Nov. 19	Jan. 8	13	51			Adenitis	Sore nose and mouth	Hulme
196	Jan. 22	2165	Nov. 14	Nov. 12	Nov. 15	Jan. 8	14	55			Nil	?	Ancoats
214	Jan. 22	2144	Nov. 12	Nov. 11	Nov. 12	Jan. 9	13	59			Nil	Discharge from ear	Cheetham
222	Jan. 22	2262	Nov. 26	Nov. 22	Nov. 26	Jan. 18	4	54			Nil	?	Newton
266	Feb. 1	1992	Oct. 25	Oct. 25	Oct. 25	Jan. 18	14	86			Rhinitis, Otitis (double), Adenitis	?	Openshaw
280	Feb. 4	2238	Nov. 22	Nov. 21	Nov. 22	Jan. 15	20	55		+	Rhinitis	Discharge from ears	St George's
290	Feb. 4	2186	Nov. 16	Nov. 13	Nov. 16	Jan. 29	6	75			Nephritis	?	Clayton
300	Feb. 9	1797	Oct. 5	Oct. 5	Oct. 5	Dec. 21	50	78			Hæm. Nephritis, Rhinitis	?	Newton
347	Feb. 15	2238	Nov. 22	Nov. 21	Nov. 22	Jan. 15	31	55			Rhinitis	Discharge from ears	St. George's
367	Feb. 18	2255	Nov. 24	Nov. 20	Nov. 24	Feb. 5	13	74			Adenitis, Rhinitis	Sore mouth, discharging, and a sore behind left ear	Rusholme
380	Feb. 21	2270	Nov. 26	Nov. 24	Nov. 26	Jan. 25	27	61			Rhinitis	Nothing observed	Hulme
407	Feb. 26	2374	Dec. 8	Dec. 6	Dec. 8	Feb. 5	21	60			Otitis (double)	Nasal discharge ?	Moston
413	Feb. 28	2329	Dec. 3	Dec. 2	Dec. 3	Feb. 19	9	79			Otitis (L.)	Discharge from nose and ears	Cheetham
440	Mar. 4	2484	Dec. 22	Dec. 22	Dec. 22	Feb. 22	10	63		+	Nil	?	Cheetham
452	Mar. 4	2464	Dec. 19	Dec. 18	Dec. 19	Feb. 12	20	56		+	Otitis (L.)	?	Hulme
464	Feb. 22	2209	Nov. 19	Nov. 18	Nov. 20	Jan. 22	31	64			Rhinitis	Nothing observed	Cheetham
469	Mar. 9	2393	Dec. 11	Nov. 20	Dec. 11	Mar. 5	4	85		+	Nephritis	Nothing observed	Cheetham
485	Mar. 7	2374	Dec. 8	Dec. 6	Dec. 8	Feb. 5	30	60		+	Otitis (double)	?	Moston
543	Mar. 19	28	Jan. 2	Dec. 31	Jan. 2	Feb. 22	25	52			Nil	Nothing observed	Newton

1901.—RETURN CASES OF SCARLATINA—*continued.*

Prog. No. of second case	Date of Eruption of second case	Prog. No. of first case	Date of Notification of first case	Date of Eruption of first case	Date of removal to Hospital	Date of return home	Interval between return and eruption in second case (Days)	No. of days in Hospital, first case	Contracted at		Complications of first case during stay in Hospital	Condition of first case when discharged as stated by the relatives	District
									Home	Another House			
575	Mar. 7	2215	Nov. 19	Nov. 18	Nov. 19	Jan. 22	44	65			Nil	Nothing observed	Hulme
599	Mar. 31	144	Jan. 17	Jan. 12	Jan. 17	Mar. 12	19	55			Rhinitis	Nothing observed	Cheetham
600	Mar. 29	131	Jan. 15	Jan. 14	Jan. 15	Mar. 12	17	57			Rhinitis	Desquamation on toes	Blackley
607	Mar. 31	196	Jan. 23	Jan. 22	Jan. 23	Mar. 22	9	59			Rhinitis, Synovitis, Adenitis	Nothing observed	Ancoats
613	Apl. 1	123	Jan. 14	Jan. 12	Jan. 14	Mar. 29	3	75			Otitis (L)	Nothing observed	Hulme
616	Apl. 1	91	Jan. 9	Jan. 9	Jan. 9	Mar. 22	10	73		+	Diph., Rhinitis, Otitis (R), Stomatitis	Nothing observed	Harpurhey
636	Apl. 5	192	Jan. 22	Jan. 21	Jan. 22	Mar. 22	14	60			Nil	Nothing observed	Hulme
655	Apl. 10	187	Jan. 21	Jan. 20	Jan. 21	Apl. 4	6	74			Nil	Discharge from ear	Hulme
656	Apl. 11	2516	Dec. 27	Dec. 25	Dec. 27	Mar. 22	20	86			Nephritis	Discharge from ear	Blackley
672	Apl. 7	281	Feb. 5	Feb. 2	Feb. 5	Mar. 26	12	50			Nil	Nothing observed	Crumpsall
679	Apl. 18	237	Jan. 28	Jan. 26	Jan. 28	Apl. 4	14	67			Nil	Nothing observed	Cheetham
689	Apl. 19	56	Jan. 5	Jan. 3	Jan. 5	Apl. 12	7	98		+	Rhinitis, Otitis (L), Orbital Cellulitis	Slight sore nose and ears	Ardwick
692	Apl. 19	348	Feb. 17	Feb. 17	Feb. 17	Mar. 29	21	40		+	Otitis (R), Adenitis	Nothing observed	Blackley
693	Apl. 20	156	Jan. 18	Jan. 17	Jan. 19	Apl. 4	16	76			Glossitis, Otitis(?), Rhinitis, Pneumonia	Discharge from nose and sore ears	Rusholme
756	Apl. 19	232	Jan. 27	Jan. 25	Jan. 27	Apl. 16	3	80		+	Rhinitis	Has an affection of ears and nose	Central
758	Apl. 27	293	Feb. 7	Feb. 7	Feb. 8	Apl. 12	15	64			Rhinitis	?	St. George's
781	May 2	434	Mar. 4	Feb. 8	Mar. 4	Apl. 12	20	40			Nil	Nasal discharge and soreness	Hulme
783	May 1	164	Jan. 19	Jan. 18	Jan. 19	Apl. 23	8	95		+	Erysipelas, Colitis, Adenitis	Desquamation of feet	Openshaw
796	May 3	Salford Hospital Case			7 weeks ago	Apl. 27	6					Desquamation on feet	Chorlton-on-Medlock
944	May 22	384	Feb. 23	Feb. 23	Feb. 23	May 7	15	74			Rhinitis, Otitis (L)	Discharge from nose and ears	Ancoats
949	May 24	361	Feb. 19	Feb. 17	Feb. 19	May 3	21	74			Adenitis, Rhinitis	Nothing observed	Newton
993	May 28	426	Mar. 4	Mar. 2	Mar. 4	May 3	25	61			Rhinitis	Desquamation on toes	Cheetham
1011	May 29	125	Jan. 14	Jan. 13	Jan. 14	Apl. 4	55	81			Adenitis	Desquamation on legs and feet	Hulme
1023	May 28	470	Mar. 11	Mar. 9	Mar. 11	May 10	18	61			Otitis (double)	Nothing observed	Harpurhey
1068	June 2	524	Mar. 19	Mar. 19	Mar. 19	May 24	9	67		+	Nil	Nothing observed	Cheetham
1211	June 20	537	Mar. 21	Mar. 20	Mar. 21	June 14	6	86			Cervical Adenitis	Discharge from sore at back of head	Clayton

Prog. No. of second case	Date of Eruption of second case	Prog. No. of first case	Date of Notification of first case	Date of Eruption of first case	Date of removal to Hospital	Date of return home	Interval between return and eruption in second case	No. of days in Hospital, first case	Contracted at		Complications of first case during stay in Hospital	Condition of first case when discharged as stated by the relatives	District
									Home	Another House			
							(Days)						
1250	June 23	628	Apl. 6	Apl. 3	Apl. 6	May 28	26	53			Nil	Nothing observed	Moston
1240	June 23	370	Feb. 20	Feb. 19	Feb. 21	May 17	37	85			Rhinitis	Nothing observed	Hulme
1351	July 2	620	Apl. 4	Apl. 3	Apl. 4	May 17	46	44			Rhinitis	?	Cheetham
1442	July 12	592	Mar. 30	Mar. 29	Mar. 30	June 4	38	67			Rhinitis	Sore nose	Hulme
1552	July 24	891	May 18	May 18	May 18	July 16	8	60			Rhinitis, Otitis	Nothing observed	Cheetham
1593	July 28	979	May 28	May 28	May 28	July 26	2	60			Albuminuria	Nasal discharge	Ancoats
1599	July 30	1083	June 8	June 8	June 8	July 26	4	49			Nil	?	Bradford
1604	July 31	992	May 29	May 28	May 29	July 26	5	59		+	Nil	Nothing observed	Cheetham
1618	July 31	992	May 29	May 28	May 29	July 26	5	59			Nil	Nothing observed	Cheetham
1632	Aug. 2	705	Apl. 23	Apl. 21	Apl. 23	July 23	10	92			Otitis, Rhinitis	Discharge from ears	Harpurhey
1643	Aug. 3	870	May 14	May 13	May 14	July 9	25	57			Rhinitis	Nasal discharge	C.-on-M.
1653	Aug. 4	1118	June 12	June 12	June 12	July 30	5	49			Nil	?	Openshaw
1704	Aug. 12	1245	June 25	June 23	June 24	Aug. 9	3	47			Nil	Nothing observed	St. George's
1726	Aug. 13	1154	June 16	June 15	June 16	Aug. 9	4	55			Nil	Desquamation on feet	C.-on-M.
1747	Aug. 16	1155	June 16	June 15	June 16	July 26	21	41			Nil	Nothing observed	Hulme
1762	Aug. 19	762	Apl. 29	Apl. 27	Apl. 29	June 21	59	53			Rhinitis		Newton
1779	Aug. 23	1138	June 15	June 12	June 15	Aug. 16	7	63		+	Otitis, Hæm., Nephritis	Appeared quite well	Cheetham
1782	Aug. 21	813	May 7	May 5	May 7	Aug. 16	5	102			Adenitis, Otitis	?	Ardwick
1801	Aug. 24	1152	June 16	June 16	June 16	Aug. 2	22	48			Nil	?	St. George's
1807	Aug. 25	1226	June 24	June 23	June 24	Aug. 16	9	54			Nil	Nothing observed	Cheetham
1815	Aug. 26	1342	July 2	June 30	July 2	Aug. 16	10	46			Adenitis	Nothing observed	Hulme
1822	Aug. 23	950	May 24	May 22	May 24	Aug. 16	7	85			Varicella	Nothing observed	Clayton
1842	Aug. 28	1201	June 20	June 20	June 20	Aug. 6	22	48			Rhinitis	?	Hulme
1857	Aug. 31	1106	June 11	June 9	June 11	July 26	36	46			Rhinitis		Cheetham
1871	Sept. 2	1155	June 16	June 15	June 16	July 26	38	41		+	Nil	Nothing observed	Hulme
1877	Aug. 30	1236	June 24	June 22	June 24	Aug. 9	21	47			Nil	Nothing observed	Openshaw
1899	Sept. 5	1587	July 29	July 29	July 29	Aug. 27	9	30			Nil	Nasal discharge	Harpurhey
1906	Sept. 5	1126	June 12	June 12	June 13	Aug. 13	23	62		+	Rhinitis, Otitis, Albuminuria	Had sore throat	Hulme
1916	Sept. 7	1355	July 3	July 1	July 3	Aug. 27	11	56			Rhinitis	Nothing observed	Cheetham
1950	Sept. 11	1461	July 15	July 13	July 15	Aug. 30	12	47			Nil	Nasal discharge	Openshaw
2023	Sept. 16	1124	June 12	June 11	June 12	Aug. 2	45	52			Nil	?	Hulme
2024	Sept. 21	992	May 29	May 28	May 29	July 26	57	59			Nil		Cheetham
2084	Sept. 28	1392	July 6	July 4	July 6	Sept. 17	11	74			Rotheln	?	Crumpsall
2087	Sept. 28	1392	July 6	July 4	July 6	Sept. 17	11	74		+	Rotheln	?	Crumpsall

1901.—RETURN CASES OF SCARLATINA—*continued.*

Prog. No. of second case	Date of Eruption of second case	Prog. No. of first case	Date of Notification of first case	Date of Eruption of first case	Date of removal to Hospital	Date of return home	Interval between return and eruption in second case	No. of days in Hospital, first case	Contracted at		Complications of first case during stay in Hospital	Condition of first case when discharged as stated by the relatives	District
									Home	Another House			
							(Days)						
2090	Sept. 29	1552	July 25	July 24	July 25	Sept. 17	12	55		+	Nil	Nothing observed	Cheetham
2118	Sept. 29	1672	Aug. 8	Aug. 7	Aug. 8	Sept. 27	2	51			Nil		
		1620	Aug. 2	Aug. 1	Aug. 1	Sept. 13	16	44		+	Otitis, Rhinitis, Albuminuria	?	Newton
2177	Oct. 7	1740	Aug. 16	July 20	Aug. 16	Sept. 24	13	40			Rhinitis	?	Newton
2181	Oct. 8	1344	July 2	June 27	July 2	Sept. 17	21	78			Rhinitis, Adenitis	Slight desquamation on face ??	Hulme
2186	Oct. 9	1396	July 6	July 3	July 6	Oct. 4	5	91			Otitis, Rhinitis, Diph., Hæm., Nephritis	Discharge from nose and ears	Rusholme
2187	Oct. 7	1683	Aug. 4	Aug. 4	Aug. 4	Sept. 27	10	55		+	Nephritis, Rhinitis	1683—Had sore nose and mouth	Hulme
		1616	July 31	July 31	July 31	Oct. 4	3	66			Rhinitis		
2221	Oct. 13	1792	Aug. 24	Aug. 23	Aug. 24	Oct. 8	5	46			Nil	Nasal discharge	Openshaw
2225	Oct. 14	1485	July 18	July 12	July 15	Oct. 8	6	86			Rhinitis, Otitis, Anginosa, Scarlet Fever	Slight discharge from ear	Rusholme
2249	Oct. 14	1688	Aug. 9	Aug. 8	Aug. 9	Oct. 1	13	54		+		?	Crumpsall
2259	Oct. 15	1752	Aug. 19	Aug. 19	Aug. 19	Oct. 8	7	51			Rhinitis	Nothing observed	Ancoats
2280	Oct. 18	1224	June 24	June 21	June 24	Aug. 13	66	51			Nil	?	St. George's
2290	Oct. 20	1752	Aug. 19	Aug. 19	Aug. 19	Oct. 8	12	51		+	Rhinitis	Nothing observed	Ancoats
2316	Oct. 22	1762	Aug. 20	Aug. 19	Aug. 20	Oct. 1	21	43			Nil	Nothing observed	Newton
2324	Oct. 22	1364	July 3	July 3	July 3	Oct. 15	7	105			Otitis, Adenitis, Rhinitis	Sore mouth	Openshaw
2331	Oct. 24	1335	July 2	July 1	July 2	Aug. 20	65	50			Nephritis	Slight discharge from ear	Central
2334	Oct. 22	1330	July 1	July 1	July 2	Aug. 16	67	46			Nil	?	Clayton
2348	Oct. 26	1874	Sept. 3	Sept. 1	Sept. 3	Oct. 22	4	49			Nil	Nothing observed	Ancoats
2356	Oct. 27	1698	Aug. 10	Aug. 8	Aug. 10	Oct. 15	12	67			Rhinitis	Nothing observed	Chorlton-on-Medlock
2370	Oct. 30	1862	Sept. 2	Aug. 31	Sept. 2	Oct. 22	8	51			Nil	Desquamation on feet	Ancoats
2371	Oct. 28						6						
2397	Nov. 4	1920 or	Sept. 9	Sept. 9	Sept. 9	Oct. 29	6	51			Nil	1920—Had sore on nose	Cheetham
2398	Nov. 4	1865	Sept. 2	Sept. 2	Sept. 2	Oct. 29	6	58			Rhinitis		
2411	Nov. 5	1803	Aug. 26	Aug. 25	Aug. 26	Nov. 1	4	68			Otitis, Rhinitis	Nasal discharge	Ancoats
2418	Nov. 4	1873	Sept. 2	Sept. 1	Sept. 2	Oct. 22	13	51			Nil	Nothing observed	Hulme
2422	Nov 5	1590	July 29	July 19	July 29	Oct. 25	11	89			Nil	Discharge from nose and ears	Rusholme

1901.—RETURN CASES OF SCARLATINA—*continued.*

Prog. No. of second case	Date of Eruption of second case	Prog. No. of first case	Date of Notification of first case	Date of Eruption of first case	Date of removal to Hospital	Date of return home	Interval between return and eruption in second case	No. of days in Hospital, first case	Contracted at		Complications of first case during stay in Hospital	Condition of first case when discharged as stated by the relatives	District
									Home	Another House			
							(Days)						
2434	Nov. 6	1637	Aug. 2	July 31	Aug. 2	Sept. 17	50	47			Nil	Nothing observed	Rusholme
		1486	July 18	July 16	July 18	Sept. 3	64	48			Rhinitis		
2445	Nov. 11	1821	Aug. 27	Aug. 25	Aug. 28	Nov. 5	6	70			Nil	Nothing observed	Bradford
2446	Nov. 10	1589	July 29	July 28	July 29	Sept. 27	44	61			Rhinitis, Otitis		Ardwick
		1518	July 22	July 20	July 22	Oct. 15	26	86			Rhinitis, Otitis	1518—Had slight nasal discharge	
2458	Nov. 10	1614	July 31	July 22	Aug. 1	Oct. 8	33	69		+	Nil	Nothing observed	Harpurhey
2463	Nov. 1	1578	July 27	July 20	July 27	Oct. 25	7	91			Morbilli, Rhinitis	Sore behind ear	Hulme
2474	Nov. 13			Oct. 27	Oct. 29	Nov. 9	4	11			Nil	Sister discharged as not having had Sc.Fr.	Openshaw
2485	Nov. 16	2001	Sept. 18	Sept. 18	Sept. 18	Nov. 5	11	49			Nil	Nothing observed	Ancoats
2488	Nov. 17	1499	July 20	July 20	July 20	Aug. 30	79	42			Nil	Nothing observed	St. George's
2491	Nov. 16	1866	Sept. 2	Aug. 30	Sept. 2	Oct. 18	29	47			Nil	Nothing observed	Cheetham
2530	Nov. 20	1907	Sept. 6	Sept. 5	Sept. 6	Nov. 15	5	71		+	Adenitis	Nasal discharge	Hulme
2541	Nov. 11	1396	July 6	July 3	July 6	Oct. 4	38	91		+	Otitis, Rhinitis, Diph., Hæm., Nephritis	?	Rusholme
2552	Nov. 25	1909	Sept. 7	Sept. 5	Sept. 7	Nov. 15	10	70			Rhinitis	Nothing observed	Cheetham
		1908	Sept. 7	Sept. 6	Sept. 7	Nov. 15	10	70			Otitis, Rhinitis		
2644	Dec. 10	2229	Oct. 14	Oct. 11	Oct. 14	Nov. 26	14	44			Nil	Nothing observed	Hulme
2678	Dec. 16	1833	Aug. 28	Aug. 27	Aug. 28	Nov. 11	35	76			Synovitis	?	Ardwick
2711	Dec. 24	1883	Sept. 3	Sept. 2	Sept. 3	Nov. 26	28	85		+	Rhinitis	Nasal discharge	Rusholme
2712	Dec. 25	1883	Sept. 3	Sept. 2	Sept. 3	Nov. 26	29	85			Rhinitis	Nasal discharge	Rusholme
2736	Dec. 27	2245	Oct. 15	Oct. 14	Oct. 15	Dec. 6	21	53			Nil	Nothing observed	Hulme

In discussing this subject, I will first present the history of the subsequent occurrence of cases in the same house during the year in a consecutive series, which will show the relation of the "return" cases to the primary cases.

Subsequent cases occurring in the same house at the following intervals in days after the eruption has appeared in primary cases removed to hospital :—

	Within 8 days	—14	—21	—31	—41	—51	—61	—71	—81	—91	—101	—111	—121	—131	—141	
Primary case not discharged from Hospital.	279	33	17	12	6	4	4	0	0	0	0	0	0	0	0	...
Primary case discharged.	0	0	2	0	1	4	15	15	26	13	10	7	8	4	1	...
Total subsequent cases 462	279	33	19	12	7	8	19	15	26	13	10	7	8	4	1	...

In addition to these, two cases occurred at later periods after the discharge of the primary cases which have not been included.

The "return" cases occurred in the same house after the discharge of the primary cases from hospital at the following intervals in days after the discharge of the primary cases :—

0–7	—14	—21	—31	—41	—51	—61	—71	Total
31	27	18	13	5	5	4	3	106

With the aid of these figures we arrive at the following conclusions, which do not differ from those already given in the Annual Report on the Health of Manchester for the year 1895.

The occurrence of "return" cases is in no way fortuitous.

It is due to the cases discharged from the hospital. A prolonged stay in the hospital is no security against the occurrence of "return" cases.

The influence of remanent infection in and about the house after the removal of the first case gradually diminishes, becomes doubtful after 4 weeks, and ceases about the eighth week. This remanent infection is probably either unremoved infective matter or is caused by intermediate overlooked cases.

It is about the same time that the influence of the discharged cases commences.

This influence commences with the discharge of the primary case, but does not appear altogether to disappear for nearly ten weeks. It is probable, however, that in the later weeks infection is due to the intermediation of cases between the discharged cases and those which come under notice.

Be this as it may, the gradual decay of this influence is manifest in the above figures.

It is not until near the end of the fourth week after the return of the first case that the discharged case ceases to be a marked factor in producing subsequent cases.

An artificial period of 14 days from discharge can, therefore, not be maintained in limiting the effect of discharged cases.

When the first cases are treated at home, no case at all occurs in 1901 amongst the susceptible persons left in the house after an interval of 41 days, and only one after an interval of 31 days. This appears to show that cases after recovery at home, which is usually declared at about six weeks, are not infective.

This is in accord with the previous analyses of cases.

It is not because there is no susceptible material to infect that no cases occur after this period, since there are 351 susceptible cases left at home under 15 years of age, and the number of infections (namely, 69) prior to recovery cannot at all be supposed to have destroyed the power of the recovered cases to infect the remaining 282 if they possessed any such power.

The phenomenon is then a hospital phenomenon, as, indeed, the above table of intervals amply shows, and the conclusions remain as evident as they were in 1895.

When cases are discharged from the hospital, in respect of their clothing, and of the exposed surface of the body, they are more completely free from infection than cases discharged at home are at all likely to be.

The infective matter, therefore, rests in some part not reached by the final bath on discharge.

The parts which occur to us are the ears, nose, and throat.

Moreover, the infection is probably derived from other cases, and does not appertain to the cases themselves, otherwise recovered cases would cause infection with comparable frequency at corresponding periods.

The great power of fresh cases to cause an accumulation of infective matter in their vicinity is amply shown by the large proportion of infections which occur within the first ten days of the primary case, whether this case is removed to hospital or is treated at home.

As already explained, the storage of infective matter must take place chiefly in the nose.

If it be still supposed that, in reality, return cases occur because the discharged cases are, *per se*, still infective, we are driven to suppose that in some way or another the infectivity of cases treated in hospital is sustained in some manner which does not prevail for cases treated outside—a most unlikely thing. Even then the measures advocated would be those calculated to avert the subsequent infection.

In presenting the above figures, it is necessary to guard against the supposition that all the cases occurring after the discharge of a primary case are due to that case.

The Type of Return Cases.

A suggestion has been thrown out by Dr. Millard which deserves investigation.

The suggestion is that the "return" disease is more severe in type than the primary cases, and that a process of hospitalisation is thus carried on which serves to maintain a more fatal type of Scarlet Fever than would otherwise prevail.

If, now, we could obtain the fatality of return cases in a sufficient number, and compare it with the fatality of non-return cases, we should have some means of gauging this supposed influence.

It would be still better if we could collect a sufficient number of further cases traced to return cases and ascertain their fatality.

The second procedure is not practicable on account of the fewness of the numbers.

But I have obtained such particulars as we possess in regard to return cases in the following shape :—

RETURN CASES—CASE MORTALITY, 1896–1900.

AGE OF RETURN CASES.

	Years	0—5	5 —	10 —	15 —	20 —	25 —	35 —	Over 45
Cases	1896	23	16	6	...	...	...	...	...
	1897	4	5	1	2	...	...	...	...
	1898	6	3	...	...	...	...	...	...
	1899	8	3	1	1	...	...	...	...
	1900	11	7	7	4	1	1	...	...
Total		52	34	15	7	1	1	...	...
Deaths	1896	6	...	...	...	...	...	...	...
	1897	3	...	...	...	...	...	...	...
	1898	3	...	...	...	...	...	...	...
	1899	2	...	...	...	...	...	...	...
	1900	1	2	...	...	...	...	...	...
Total		15	2	...	...	...	...	...	...
Case Fatality per cent.	....	29·0	6·0	...	...	...	...	...	...
All Cases......	Cases 1896 – 1900 ...	2929	3687	1533	476	229	163	41	12
	Deaths 1896 – 1900...	356	121	22	20	6	4	1	1
Case Fatality per cent.........		12	3	1·4	4·2	2·6	2·5	2·4	8·3

RETURN CASES—CASE MORTALITY, 1901.

In exhibiting the figures for 1901 I have separated "return" cases occurring within 21 days of the discharge of the first case from those occurring 21 days or longer after the discharge of the first case. We thus get

CASES OCCURRING AT HOME WITHIN 21 DAYS OF DISCHARGE.

Ages of Return Cases	0—5	5 —	10 —	15 —	20 —	25 —	35 —	45 and upwards	Total
Number of Cases	28	20	14	1	1	3	1	0	68
Number of Deaths......	5	0	1	0	0	0	0	0	6

CASES OCCURRING AT HOME 21 DAYS AND UPWARDS AFTER DISCHARGE.

	0—5	5 —	10 —	15 —	20 —	25 —	35 —	45 and upwards	Total
Cases	10	17	7	1	1	0	1	1	38
Deaths	2	0	1	0	0	0	0	0	3

RETURN CASES OUTSIDE THE HOME.

	0—5	5 —	10 —	15 —	20 —	25 —	35 —	45 and upwards	Total
Cases	8	11	4	1	3	0	0	0	27
Deaths	0	0	0	0	0	0	0	0	0

We note that, both in regard of the return cases prior to 1901 and for 1901, the ordinary numerical relation of Scarlet Fever incidence at the early ages does not hold, and that there are more "return" cases at ages 0 to 4 than at ages 5 to 9. This may quite well be due to the discharged cases holding susceptible infants close to their face.

The same consideration would, however, favour an increase in the general fatality.

The total general fatality in 1896 to 1900 is 5·85 per cent.
Return case fatality is........................ 31·64 per cent.

In 1901 the corresponding figures are :—

Total case fatality per cent.............................. = 4·6
Return case fatality at home within 21 days ...... = 8·82
Return case fatality at home beyond 21 days ... = 7·89
Return case fatality outside the home............... = 0

We see also that not only is the general case fatality of return cases greater than that of all cases, but the case fatality at the corresponding ages is increased.

There is, therefore, some basis in fact for the suggestion in so far as the return cases themselves are concerned.

The increased fatality is, however, in all probability mainly explicable by the undue preponderance of cases at an early age period.

At ages above 0 to 5 there is no material difference in the fatality.

Thus, so far as the figures available go, we are inclined to believe that in reality return cases are not of a more severe type than other cases, and that their apparent severity is due mainly to the age of the cases.

As regards their infectivity, what facts we possess would indicate that they are not more infectious than ordinary cases.

On the other hand, we are thus brought to the point that so long as the measures taken are inadequate to keep down the occurrence of return cases, the hospital is a source of danger to very young children, whom it is one of the prime objects of isolation in hospital to protect.

SEASONAL INCREASE OF SCARLET FEVER.

In previous reports attention has been drawn to the autumnal increase in the number of cases of Scarlet Fever, and reasons have been given for suspecting that this increase has to do with fouling of the soil. Now if such were the case, there should be some means of ascertaining the effect of the soil.

We might expect, for example, if an annual increment is caused in the prevalence of Scarlet Fever by a growth of the specific germ in the soil that there would be a change in the severity of the disease in the direction, probably, of amelioration.

It seems also reasonable to suppose that, if such a mode of infection prevails, the smaller children, being nearer the ground, would be more especially attacked, and consequently that if we take the untraced cases we shall have a shifting of the incidence of Scarlet Fever downwards in point of age. The year 1901 offers special facilities for such an inquiry, as the autumnal increase began abruptly in the week ending September 1st.

If we jot down the number of untraced cases beginning with this week at ages 0 to 4, 5 to 9, 10 to 14 inclusive, we get :—

0—4	5—	10—
72 ……	137 ……	80

Now if we consult the table giving the age distribution of Scarlet Fever, we find that, so far from there being an increase at the lower ages, the numbers at ages 5 to 9 increase at the expense of those at ages 0 to 4, and the numbers at ages 10 to 14 at the expense of both.

So far, then, as this line of inquiry goes the hypothesis is not sustained.

Again, if the type of disease changes favourably in the autumn, we should obtain some evidence of this. As a first step we may examine the quarterly fatality figures. On the hypothesis of a favourable change of type there should be a diminution of fatality in the third quarter of the year. This we can scarcely expect to hold invariably, since it would be liable to subversion by an increase in return cases, and by limited extensions of the disease in the ordinary way. The record of incidence and of case fatality per cent. in quarters for the ten years 1892–1901 is as follows :—

Scarlet Fever Record of Incidence and of Case Fatality Per Cent. in Quarters for the Ten Years 1892–1901.

Year	Cases	Deaths	Case Fatality Per Cent.
1892—First Quarter	316	22	6·96
Second Quarter	420	50	11·91
Third Quarter	447	33	7·38
Fourth Quarter	484	34	7·03
1893—First Quarter	382	48	12·57
Second Quarter	447	35	7·83
Third Quarter	549	24	4·37
Fourth Quarter	656	33	5·03
1894—First Quarter	448	28	6·25
Second Quarter	498	20	4·02
Third Quarter	554	36	6·50
Fourth Quarter	725	32	4·41
1895—First Quarter	416	47	11·30
Second Quarter	405	21	5·19
Third Quarter	710	47	6·62
Fourth Quarter	765	58	7·58
1896—First Quarter	623	54	8·67
Second Quarter	576	52	9·03
Third Quarter	691	50	7·24
Fourth Quarter	510	42	8·24
1897—First Quarter	334	21	6·29
Second Quarter	333	26	7·81
Third Quarter	518	29	5·60
Fourth Quarter	600	48	8·00
1898—First Quarter	354	27	7·63
Second Quarter	206	10	4·85
Third Quarter	167	16	9·58
Fourth Quarter	191	12	6·28
1899—First Quarter	161	9	5·59
Second Quarter	248	10	4·03
Third Quarter	389	8	2·06
Fourth Quarter	663	19	2·87
1900—First Quarter	575	28	4·87
Second Quarter	513	24	4·68
Third Quarter	641	23	3·59
Fourth Quarter	779	30	3·85
1901—First Quarter	573	26	4·54
Second Quarter	724	36	4·97
Third Quarter	766	37	4·85
Fourth Quarter	686	28	4·08

In so far as it enables us to form a judgment on the question of change of type, this table suggests that the type of Scarlet Fever prevailing in the third quarter of the year is less severe than in the other three quarters of the year. In five out of ten years the case fatality is lowest in the third quarter. In one instance it is lowest in the first, in three in the second, and in one in the fourth quarter. Thus in 8 out of 10 it is lowest in the mid-half of the year. The number of cases is greater in the third quarter than in the second in 9 out of 10 years. The exceptional year is 1898, and in that year the case fatality was very high in the third quarter, but no increase occurred in that quarter.

The disease ascends rapidly in the third quarter in 1893, 1895, 1896, 1897, 1899, 1900, and out of these six years, five coincide with the years when the fatality in the third quarter is lowest. In 1892 and 1901 the increase takes place in the second quarter. In both instances the case fatality is greatest in the second quarter. In 1894 the chief increase is in the third quarter and the death-rate, though it drops, is not quite so low as in the first quarter. Thus, there is no absolute correspondence between increase in the number of cases and decrease of fatality. But it does appear that the usual increase in the number of cases of Scarlet Fever in the third quarter of the year when well marked is generally associated with an amelioration in the type of the disease.

It is necessary in all inferences to be drawn from statistics of this nature, to ask oneself whether some flaw does not exist in the figures themselves. One obvious possibility is that the figures of incidence do not really represent all the cases of Scarlet Fever occurring, and that this incoordination happens more at one period of the year than another.

Now there is always a percentage of cases, fluctuating according to the type of the disease, and greatest with a mild type, which altogether escapes observation. It is probable, also, that during the summer holidays there is actual concealment.

At all events, there is reason to believe that more cases escape observation at this period, and we must suppose that the effect of this would rather be to intensify the greater mildness of type prevailing in the third quarter of the year.

So far, then, as this line of inquiry goes, it tends to support the idea of a change of type such as growth in the soil might be expected to produce.

History of Scarlet Fever during the Years 1891–1900.

We may now turn our attention to the history of Scarlet Fever in the different sanitary districts during the ten years 1891-1900. This is exhibited in the following tables :—

Table **1**, the table of population already given on page 4.

Table 2, the number of cases in each sanitary district each year :—

Cases of Scarlet Fever Notified.

Statistical Divisions		1891	1892	1893	1894	1895	1896	1897	1898	1899	1900
City of Manchester		**1,138**	**1,671**	**2,031**	**2,230**	**2,302**	**2,389**	**1,790**	**897**	**1,467**	**2,507**
I.—Manchester Township ...		285	537	362	554	621	517	521	169	329	476
II.—North Manchester.........		291	593	672	670	577	600	521	256	601	935
III.—South Manchester.........		562	541	997	1,006	1,104	1,272	748	472	537	1,096
I.	Ancoats	71	131	94	183	166	125	211	57	82	176
	Central	64	141	95	87	148	146	178	64	113	97
	St. George's.............	150	265	173	284	307	246	132	48	134	203
II.	Cheetham	73	121	155	166	160	128	192	91	185	137
	Crumpsall	25	24	43	33	42	33	29	23	23	34
	Blackley	27	27	49	24	13	18	7	4	28	28
	Harpurhey	20	47	33	97	34	34	24	26	105	146
	Moston	6	25	22	10	27	49	14	17	78	109
	Newton	74	238	186	180	127	161	109	37	95	259
	Bradford	37	53	94	99	90	84	94	34	32	127
	Beswick	22	52	69	43	66	73	35	19	37	68
	Clayton	7	6	21	18	18	20	17	5	18	27
III.	Ardwick	54	79	149	91	261	175	123	76	102	193
	Openshaw	44	81	190	128	89	117	119	72	54	136
	West Gorton	77	35	140	114	129	93	76	79	52	172
	Rusholme and Kirk. ...	36	32	93	69	56	64	47	61	115	141
	Chorlton-on-Medlock ...	150	88	191	289	227	312	207	74	103	167
	Hulme.....................	201	226	234	315	342	511	176	110	111	287

Table 3, the incidence of Scarlet Fever per 1,000 of population in each year, with the average and mean incidences per 1,000 for the ten years :—

SCARLET FEVER INCIDENCE RATE PER 1,000 LIVING.

STATISTICAL DIVISIONS		1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	Average 1891-1900	Mean Incidence 1891-1900
City of Manchester ……		**2·238**	**3·263**	**3·937**	**4·292**	**4·399**	**4·533**	**3·372**	**1·678**	**2·724**	**4·621**	**3·506**	**3·507**
I. Manchester Township…		1·922	3·652	2·483	3·834	4·337	3·644	3·708	1·214	2·388	3·490	3·067	3·073
II. North Manchester ……		2·318	4·585	5·046	4·886	4·087	4·130	3·491	1·664	3·799	5·748	3·975	4·025
III. South Manchester ……		2·396	2·295	4·209	4·228	4·620	5·301	3·105	1·952	2·214	4·503	3·482	3·490
I.	Ancoats …………	1·504	2·784	2·005	3·920	3·571	3·702	4·583	1·245	1·800	3·886	2·798	2·804
	Central………………	2·103	3·766	2·597	2·435	4·243	4·288	5·357	1·974	3·574	3·147	3·348	3·291
	St. George's …………	2·390	4·324	2·775	4·574	4·965	3·996	2·155	0·787	2·210	3·367	3·154	3·163
II.	Cheetham……………	2·520	4·062	5·063	5·279	4·957	3·866	5·657	2·618	5·198	3·763	4·298	4·332
	Crumpsall……………	3·298	3·108	5·470	4·125	5·165	3·995	3·458	2·702	2·665	3·889	3·788	3·798
	Blackley …………	3·740	3·653	3·477	3·102	1·644	2·229	0·850	0·476	3·269	3·210	2·565	2·835
	Harpurhey …………	2·321	5·116	3·371	9·305	3·064	2·881	1·913	1·952	7·426	9·736	4·708	4·910
	Moston………………	1·135	4·338	3·504	1·460	3·631	6·060	1·593	1·782	7·534	9·711	4·077	4·516
	Newton……… ……	2·159	6·808	4·985	5·220	3·436	4·283	2·852	0·953	2·411	6·478	3·959	3·962
	Bradford …………	1·822	2·561	4·462	4·618	4·128	3·791	4·177	1·489	1·382	4·298	3·273	3·409
	Beswick …………	2·233	5.172	6·732	4·117	6·192	6·745	3·180	1·699	3·258	5·900	4·523	4·532
	Clayton………………	2·032	1·591	5·088	3·987	3·647	3·711	2·890	7·792	2·574	3·545	3·686	2·973
III.	Ardwick …………	1·525	2·193	4·067	2·443	6·894	4·550	3·149	1·916	2·533	4·723	3·399	3·424
	Openshaw …………	1·805	3·280	7·597	5·055	3·473	4·513	4·538	2·709	2·015	5·022	4·001	4·011
	West Gorton…………	3·074	1·373	5·397	4·321	4·808	3·410	2·742	2·806	1·819	5·926	3·568	3·585
	Rusholme and Kirk…	2·059	1·798	5·137	3·747	2·192	3·364	2·431	3·106	5·766	6·965	3·657	3·793
	Chorlton-on-Medlock.	2·513	1·477	3·211	4·869	3·834	5·284	3·517	1·262	1·762	2·869	3·060	3·069
	Hulme ………………	2·770	3·133	3·264	2·791	4·836	7·279	2·526	1·591	1·619	4·221	3·403	3·578

Table 4, the number of deaths in each district year by year, and the total number for the ten years, with the mean death-rates for the ten years :—

DEATHS FROM SCARLET FEVER.

STATISTICAL DIVISIONS		1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1891-1900	Mean Death-rates 1891–1900
City of Manchester		**101**	**143**	**133**	**115**	**176**	**195**	**130**	**59**	**44**	**103**	**1,199**	**0·23**
I.—Manchester Township		30	53	30	37	58	58	43	10	11	22	352	0·25
II.—North Manchester		20	52	50	26	32	37	45	17	13	39	331	0·23
III.—South Manchester		51	38	53	52	86	100	42	32	20	42	516	0·22
I.	Ancoats	7	18	8	13	15	17	20	1	2	8	109	0·24
	Central	10	9	9	8	18	13	13	7	1	7	95	0·28
	St. George's	13	26	13	16	25	28	10	2	8	7	148	0·24
II.	Cheetham	5	11	6	5	5	5	6	3	4	3	53	0·16
	Crumpsall	4	0	3	0	4	4	4	0	0	0	19	0·23
	Blackley	0	2	6	0	0	2	1	0	0	1	12	0·15
	Harpurhey	3	1	5	6	1	0	2	3	1	4	26	0·23
	Moston	0	1	3	1	1	4	0	3	0	1	14	0·18
	Newton	4	23	12	11	8	10	7	3	3	17	98	0·26
	Bradford	2	4	7	3	10	9	19	3	2	10	69	0·32
	Beswick	2	9	6	0	3	2	4	1	3	3	33	0·31
	Clayton	0	1	2	0	0	1	2	1	0	0	7	0·13
III.	Ardwick	5	11	6	6	20	19	10	5	5	8	95	0·25
	Openshaw	2	7	14	5	5	7	7	3	4	1	55	0·21
	West Gorton	7	1	4	4	17	8	4	7	1	11	64	0·24
	Rusholme and Kirk.	1	0	5	3	3	2	2	3	0	3	22	0·12
	Chorlton-on-Medlock	16	1	12	15	17	24	9	4	4	6	108	0·18
	Hulme	20	18	12	19	24	40	10	10	6	13	172	0·25

Table 5, the mean case fatality :—

SCARLET FEVER ATTACKS FOR EACH SANITARY DISTRICT, 1891–1900.

STATISTICAL DIVISIONS		Total Attacks	Total Deaths	Case Fatality	Number of Removals	Per cent. of Removals
City of Manchester		**18,422**	**1,199**	**6·51**	**12,945**	**70·3**
I.	Manchester Township	4,371	352	8·05	3,559	81·4
II.	North Manchester	5,716	331	5·79	3,892	68·1
III.	South Manchester	8,335	516	6·19	5,494	65·9
I.	Ancoats	1,296	109	8·41	1,063	82·0
	Central	1,133	95	8·38	978	86·3
	St. George's	1,942	148	7·62	1,518	78·2
II.	Cheetham	1,408	53	3·76	969	68·8
	Crumpsall	309	19	6·15	203	65·7
	Blackley	225	12	5·33	121	53·8
	Harpurhey	566	26	4·59	395	69·8
	Moston	357	14	3·92	208	58·3
	Newton	1,466	98	6·69	967	66·0
	Bradford	744	69	9·27	545	73·3
	Beswick	484	33	6·82	384	79·3
	Clayton	157	7	4·46	100	63·7
III.	Ardwick	1,303	95	7·29	920	70·6
	Openshaw	1,030	55	5·34	548	53·2
	West Gorton	967	64	6·62	636	65·8
	Rusholme and Kirk'hulme	714	22	3·08	361	50·6
	Chorlton-upon-Medlock	1,808	108	5·97	1,154	63·8
	Hulme	2,513	172	684	1,875	74·6

These tables suffice to give us all the information available. The death rates have not been calculated out for each year.

From the tables showing the incidence in different years, we perceive that the period of ten years exhibits a wave of Scarlet Fever which, for the whole City, extends from 1891 to 1898, and which is manifest in all the districts, or rather corresponding wavelets are manifest in the districts whose coalescence results in the wave for the whole City. But neither the period of these smaller waves, nor their maximum period, necessarily corresponds with that for the whole City.

Thus for the whole City the maximum is in 1896, the minimum in 1898 :—

	Year of Maximum Incidence	Year of Minimum Incidence
Manchester Township	1895	1898
North Manchester	1893	1898
South Manchester	1896	1898

The facts are as follows :—

	Year of Maximum Incidence	Year of Minimum Incidence
City of Manchester	1896	1898
Manchester Township	1895	1898
North Manchester	1893	1898
South Manchester	1896	1898
Ancoats	1897	1898
Central	1897	1898
St. George's..........................	1892 and 1895	1898
Cheetham	1894 and 1897	1898
Crumpsall	1893 and 1895	1899
Blackley	1891	1895 and 1898
Harpurhey	1892 and 1894	1898
Moston	1892 and 1896	1894 and 1897 (two periods of 4 years each
Newton	1892	1898
Bradford	1894	1898
Beswick	1893 and 1896	1898
Clayton	1893 and 1898	1897
Ardwick	1893 and 1895	1898
Openshaw	1893	1899
West Gorton	1893	1899
Rusholme	1893	1895
Chorlton-on-Medlock	1894 and 1896	1898
Hulme..................................	1896	1898

On inspection of the tables of incidence, we note the precipitate descent of the periodic wave in the year 1898, and that not only for the whole City, but for each of its divisions.

This can only mean that certain seasonal conditions, conditions of weather, in fact, are capable of powerfully modifying the periodic wave, or even of obliterating it for the time being, as is suggested in the case of Cheetham and Bradford.

It is something to know that such is the case, even if we cannot at once determine whether the conditions concerned are atmospheric, or are indirect and due to changes in the soil.

So far as the above table of maximal and minimal incidences enables us to judge, the history of Scarlet Fever in the ten years is that it overran first the outer districts of the City, beginning in Blackley, Moston, St. George's, Harpurhey, and Newton in 1891 and 1892, extending to the other outer districts in 1893 and 1894. In 1895 it reached a maximum in St. George's and Ardwick, in 1896 in Chorlton-on-Medlock and Hulme, and in 1897 in the Cheetham, Ancoats, and Central districts.

If, then, this disease spreads by lateral extension, as to some extent it must do, it takes a long time to extend in any force from one district to another. The course of the disease as shown in these figures is in accord with what we have previously deduced from its history in schools. Except under unfavourable circumstances, it is not a rapidly extending disease.

It has been said that the periodic wave varies in length.

In the whole City it takes 7 years, from 1891 to 1898.

In the Manchester Township it takes 7 years, from 1891 to 1898.

In North Manchester the period is the same. In South Manchester it is practically the same, allowing for the disturbance of the favourable year 1898—that is, from 1892 to 1899.

In Ancoats it is 7 years, 1891 to 1898. In St. George's and the Central Districts it is obscured by fluctuations in 1892, 1893.

In Cheetham it appears to be 5 years, from 1891 to 1896.

In Blackley half a wave extends over 4 years.

In Harpurhey it is 6 years, from maximum to maximum or from minimum to minimum.

In Moston there are 2 waves, each of 3 years

In Newton the period is at least 7 years. In Bradford it is 8 years, in Beswick 7 years, in Clayton 5 years, in Ardwick 7 years, in Openshaw 8 years, in West Gorton 7 years, in Rusholme 5 years, in Chorlton-on-Medlock 6 years, in Hulme there are two periods of 3 years each.

The double period of 3 years in Hulme and Moston probably have the same explanation. Both are large districts, though only Hulme has a large population. Moston has two widely detached urban populations, and the double wave no doubt means for both districts separate outbreaks in different parts of the district.

The aggregate result is that in the separate districts it takes as an average seven years for a Scarlet Fever wave to run its course. Again, the explanation is that Scarlet Fever is a disease which extends itself with difficulty as compared, for example, with Influenza, Measles, and Whooping Cough.

In other ways also the same fact is impressed upon us, as for example by a study of contiguous districts.

With regard to the course of the incidence rate on different districts, it is notable that this has varied from one year to another considerably more in North Manchester than in the other two divisions of the City. The districts in which the variation has been exceptionally great are Harpurhey, Moston, Newton, Beswick, Clayton, Openshaw, and Hulme.

Of these, Harpurhey, Moston, and Clayton are comparatively small districts. In Harpurhey school influence has greatly affected the fluctuation. Why the fluctuation should be greater in the other districts is not so easy to say. In Newton Heath the schools contributed materially to the high incidence in 1900, and probably the same explanation is applicable to the other districts.

When, however, we pass from a comparison of one year with another, to the total rate of incidence for ten years, taking either the average incidence rate or the mean incidence rate, we find that this is lowest in the following districts:—Ancoats, Central, St. George's, Blackley, Bradford, Ardwick, Chorlton-on-Medlock, Hulme, West Gorton. Thus the incidence rate of Scarlet Fever pursues a course which we see to be nearly the inverse of that of the death-rate, and is least on the most insanitary districts.

With reference to the question of the hospital influence, these are also, in the main, the districts with the highest percentage of removals to the hospital, and, if we could accept the facts, we must conclude that the hospital exercises a decided influence in diminishing the incidence of Scarlet Fever. But we must also conclude that the careless or careful habits of the people have no influence on the disease, and that, so far from an undue amount of filth in the neighbourhood of the dwellings serving to increase Scarlet Fever, it has either no influence, or what it has is in an opposite direction.

If, now, we consult the table of case fatality, showing the number of deaths per 100 cases notified, we find that this is in precisely the opposite direction to the incidence rate. The districts having the highest case fatality being, in order, Bradford, Ancoats, Central, St. George's, Ardwick, Beswick, Newton, Hulme, West Gorton.

It is impossible not to be roused to a strong suspicion that in the more insanitary parts of the City, where the people are poorest, there is a considerable proportion of the cases which never come under the attention of the Sanitary Authority. Indeed there is certainly, everywhere, such an element, which varies considerably.

Thus the incidence rate helps to tell us the relative proportion of cases from one year to another in the same district, but is not to be relied upon in comparing one district with another. We are thus obliged to fall back on some other estimate, and one estimate available is the death-rate measured on the population. It would be more satisfactory if we had for each district the population at ages susceptible to Scarlet Fever, but this we do not possess. The death-rate per 1,000 of the mean population of the ten years is given on page 78, and if taken as an estimate of the prevalence of Scarlet Fever has its own errors.

The errors which it involves are (1) the hypothesis that the different districts are similarly constituted as regards the number of children susceptible to Scarlet Fever, (2) the hypothesis that the disease will be equally fatal in cases from different districts. That (2) is a very serious source of error is conclusively shown by the figures relating to case fatality. The first source of error is also a serious one.

Taking the figures of the death-rate from Scarlet Fever as an estimate of the incidence of the disease, that is to say, assuming a uniformity of fatality, the districts stand in the following order of descending severity:—Bradford, Beswick, Newton Heath, Ardwick, Central, Hulme, St. George's, and West Gorton, and the results are largely the inverse of those derived from the number of cases notified.

A consideration of these difficulties suggests again that the figures of incidence may be more nearly correct than appears from the death-rates taken as their index. The incidence rate is measured per 1,000 of the population, but if we consult tables showing the birth-rates in the different districts in successive years we may find that the infant population in the districts with a low rate of incidence is low, in which case the low incidence on the total population might coincide with a high rate of incidence on the small susceptible populations. The reverse is the fact. The birth-rates in Ancoats, Bradford, Beswick, Ardwick, and West Gorton are so very high that the high infantile mortality in these districts is insufficient to level the numbers down.

One is, however, reluctantly compelled to reject the death-rate per 1,000 of population as a reliable estimate of incidence. Possibly some figure which takes account of the incidence of notified cases and of the death-rate per 1,000 of population might serve as an approximation—say their product.

If, however, this be a correct conclusion, the comparative want of success of our fever hospitals is due in considerable measure to the cases which never come under the observation of the Sanitary Authority.

Further, if the above reasoning be correct, we must altogether discard incidence rates in comparing districts having isolation hospitals, and practising effective isolation, with those which do not possess them. For not only are the usual incidence errors applicable to the districts in unequal degrees, but fresh and divergent errors arise. The presence of the hospital exercises pressure towards or adverse to notification according as the hospital is generally liked or the reverse, nor is this a hypothetical but a real and powerful factor. Thus a favoured hospital will cause a decided increase in notification as a whole.

I am satisfied that considerable variations will be introduced into the number of cases notified, and therefore into the fatality, according as

(1) There is an isolation hospital, and a large proportion of the cases are isolated ;

(2) There is an isolation hospital, and a comparatively small proportion are isolated ;

(3) There is no isolation hospital.

Moreover, we have seen that great differences arise from seasonal conditions between one year and another, and it may be presumed, therefore, that like factors introduce considerable differences between one place and another over the same periods.

Indeed, so many and so great are the disturbing factors that it is hardly possible to compare one set of towns with another.

As regards the need for and the value of isolation, it is impossible, for example, to compare large cities like London, Manchester, and Liverpool, with their streams of visitors and their great aggregations of very poor people, with industrial populations like those of Oldham, Preston, and Blackburn, where isolation at home in an effective manner can be and is practised in almost all parts of the towns. This indeed is fully realised by Dr. Millard.

Dr. Millard also points out that the incidence rates are unsatisfactory, not for the reasons which I have given, but because of the fluctuation of epidemics, which I believe he has, on the whole, reasonably allowed for.

If, now, we were to rely on the fatality as an estimate of the extent to which a district is affected with Scarlet Fever, as Dr. Millard would do, we have this remarkable thing, so far as Manchester is concerned, that the order of the districts is practically inverted. Nor can we be altogether surprised at this. Let N be the number of cases of Scarlet Fever notified in one year, D the number of deaths from Scarlet Fever during the year, and P the population, then the annual rate of incidence per 1000 of population is $1000 \frac{N}{P}$, and the fatality per 1000 cases reported is $1000 \frac{D}{N}$. The rate of incidence is thus subject to one great source of error in the number of cases notified, while the fatality is subject to this, and to the smaller error arising in the number of deaths not being correct. But the fatality is affected by errors of notification in a manner precisely the inverse of that in which the incidence is affected.

Supposing the deaths and population to be correct, if the incidence was $\frac{10}{}$ of what the figures revealed, the fatality as given by the figures would be $\frac{9}{10}$ of what it should be.

The fatality is thus even less reliable than the incidence, to the extent that D is less reliable than P.

How great are the fallacies introduced by comparisons of different districts is readily seen by comparing the figures for Manchester and Salford (page 26, Millard).

However, in spite of the uncertain elements with which he is working, he has handled his materials with great skill, though the error mentioned above has somewhat led him astray. Thus when on page 22 he says that the fatality of Scarlet Fever during the past ten years in the great towns appears to tend to vary directly with the extent to which hospital isolation is practised, if for the fallacious element fatality were substituted the somewhat less fallacious element death-rate (or mean mortality), it appears that the mean mortality in towns isolating below 40 per cent. of cases is much lower than that in towns with practically no isolation.

Owing to the numerous sources of fallacy in his comparisons, it can only be said that he has made a case for inquiry, but further it would not be safe to go. Such an inquiry can only be usefully carried out within a district served by an isolation hospital.

Even then the sources of fallacy are such that general statistics have to be handled with caution, and each case on which such statistics are founded must be scrutinised.

Having regard to the higher fatality attaching to children attacked with any fatal infectious disease in the poorest district, it is probable that the actual incidence is below the average in such districts as Ancoats, Central

St. George's, and Hulme, which are all districts showing a high proportion of removals to hospital. It is also probable that, in these districts, both the incidence and the mortality would have been considerably higher in the absence of the hospital.

The statistical examination, however, though necessary, must yield results open to many doubts and criticisms.

The only reliable result is to be obtained by the study of a large number of individual cases. When we have carefully excluded overlooked cases, an operation which is essential if we are not to introduce errors in comparison with which the statistical fallacies are trifles, we get a large number of cases treated at home, and a much larger number treated in hospital, and we are able to analyse the further history of the households in which they occur. Even here we are subject to the error of slight cases, which altogether escape the observation of the Sanitary Authority.

We are able conclusively to show that the hospital cases come from a much poorer and, as we know quite well, much less careful class of household than those who are treated at home, a household, very often, in which isolation cannot be attained.

Even so, if we include all subsequent cases, which is the fairer proceeding, the households in which cases are treated at home show a higher proportion of subsequent cases in proportion to the susceptible material.

Had the cases removed to hospital been left at home, this disparity would unquestionably have been much greater.

The number of return cases occurring in 1901 seriously reduced the advantage accruing from the hospital.

In order, then, to obtain the full advantage which the hospital is, in my opinion, capable of conferring, we must find means to get rid of the occurrence of "return" cases; and Dr. A. K. Gordon, the Medical Superintendent of Monsall Hospital, is engaged in a strenuous effort to effect that object.

It is doubtful whether we can ever hope for more than a reduction of the incidence and of the fatality of Scarlet Fever, since we have always to contend with the factor of overlooked or concealed cases, as well as with invasion from other districts.

If it be objected that the mortality from Scarlet Fever does not justify so much study in face of the much more important questions affecting public health, I would say that many of the particulars and considerations collected here are applicable to the study of other diseases, and that the views put forward by Dr. Millard, and widely disseminated, affect very much our views of hospital isolation. They appeared, therefore, to require a careful and just analysis from a different and, as I think, on the whole, more reliable standpoint.

The following is a brief epitome of the history of infection of Scarlet Fever in 1901 :—

In 570 instances patients were clearly infected at home. In 113 the infection was traced to probable sources outside. Overlooked cases played a prominent part in causing infection. This has already been considered in connection with the home. But this factor is even more prominent with outside cases.

The most striking factor outside the home is the number of cases in which infection is traced to a neighbouring house. In only one instance is infection ascribed to the Medical Attendant.

It is, however, a very important question whether persons visiting their relatives removed to hospital do not, when they actually enter the wards, or even stay about the corridors, carry home the disease in their clothes or persons, in spite of all precautions.

The following cases throw some light on this question :—

Case 35.—Father is a disinfector.

Case 191.—Playing with girl from an infected house.

Case 772.—Workmate comes from an infected house.

Case 1911.—Brother being nursed outside Manchester. Grandmother from the house in which he is living visited patient 3 days before the beginning of her illness.

Case 2245.—Playing with girl from next house but one. Brother of this girl was removed to hospital 3 days previously.

In none of the supposed sources of infection was there any suspicion of illness.

The question is an important one, since the occurrence of cases at home some time after removal of the first case is often susceptible of this explanation.

A few instances have been collected in which cases occurred in the same house the year before. But no importance can be attached to them, and it is certain that the facts have not been systematically ascertained.

Suppose 2,000 primary cases to occur in 100,000 houses in two successive years, the chances of the same house being infected two years running are considerably above 4/10,000, giving 40 cases.

As a mere matter of chance, therefore, there must be a considerable number of these cases.

From the following tables we find that the year 1901 was one in which the incidence of Scarlet Fever was exceptionally severe. The number of cases notified was 2,692. The usual drop in the second three months of the year was absent, and, instead, the disease made a sharp rush upwards in the second quarter.

In spite of the very large number of cases notified, the proportion removed to hospital was higher than ever, viz., 82·3 per cent. The proportion removed was highest in the poorest districts, and table 3 shows that this proportion bears no relation to either incidence or fatality so far as revealed by the experience of 1901.

A comparison of the death-rates from Scarlet Fever in Manchester and in the country generally would appear to show that there is a general correspondence. We have already seen that this is probably the case. But if we compare the previous five years we find that, if such is the fact, the other causes in operation were sufficiently powerful to obscure it.

It is probable that we shall now be on the descending side of the periodic wave of Scarlet Fever.

The annual tables for 1901 are herewith given, and will serve to illustrate the above observations, while they are necessary to carry on the history of the disease in Manchester.

We may thus summarise the above inquiry :—

1. The isolation of cases of Scarlet Fever in hospital, as shown by a minute study of the facts of 1901, shows an actual reduction of the incidence of Scarlet Fever as the result of hospital isolation—not, however, so great as we could desire.

2. The chief influences working against the utility of the hospital as a preventive agent are the number of return cases and the number of overlooked and doubtful cases.

3. Had the hospital not been available, the number of cases would have, to all appearances, been much increased.

4. The statistics hitherto adduced to prove the inutility of isolation in hospital are quite unreliable, the sources of error being altogether too great.

5. It is probable that by adequate hospital administration, return cases may be sufficiently reduced to render them almost inoperative for harm.

6. The possibility of Scarlet Fever receiving a reinforcement from growth of the infection outside the body, in the soil, has received attention, and some fresh considerations are introduced which, on the whole, support that view.

7. This investigation is given at considerable length, as, in a matter which so profoundly affects isolation in hospital, it is desirable to show that it has at all events received a full and adequate consideration.

SCARLET FEVER.

The following are the tables relating to the occurrence of this disease at different periods of the year and in the different sanitary districts of the City, and to its severity in districts and at different ages.

Table 1.

Scarlet Fever, 1901.—Attacks in Weeks according to Date of Rash.

First Quarter		Second Quarter		Third Quarter		Fourth Quarter	
Jan. 5	57	April 6	34	July 6	72	Oct. 5	62
" 12	51	" 13	35	" 13	57	" 12	67
" 19	52	" 20	41	" 20	62	" 19	68
" 26	62	" 27	52	" 27	62	" 26	57
Feb. 2	38	May 4	49	Aug. 3	60	Nov. 2	47
" 9	25	" 11	48	" 10	54	" 9	51
" 16	45	" 18	52	" 17	44	" 16	48
" 23	41	" 25	74	" 24	50	" 23	46
Mch. 2	31	June 1	54	" 31	59	" 30	35
" 9	51	" 8	55	Sept. 7	56	Dec. 7	41
" 16	31	" 15	76	" 14	64	" 14	38
" 23	40	" 22	80	" 21	58	" 21	38
" 30	37	" 29	85	" 28	53	" 28	47
Total...	561	Total...	735	Total...	751	Total...	645

City Total, 2692.

Table 2.

Scarlet Fever Attacks, 1901.—Rates per 1,000 living, compared with Mean of Five Years.

	1896	1897	1898	1899	1900	Mean	1901
Twelve Towns *	4·77	3·87	3·51	5·10	4·82	**4·41**	5·07
City of Manchester	4·42	3·34	1·66	2·69	4·62	**3·35**	4·93
Manchester Township	3·48	3·58	1·16	2·27	3·49	**2·80**	3·66
North Manchester	4·25	3·67	1·77	4·07	5·85	**3·92**	5·30
South Manchester	5·08	3·01	1·88	2·12	4·44	**3·31**	5·37

* These are Blackburn, Bolton, Bradford, Burnley, Huddersfield, Hull, Leeds, Liverpool, Oldham, Preston, Salford, and Sheffield.

TABLE 3.

1901—SCARLET FEVER ATTACKS IN DISTRICTS, WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1,000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats	139	3·09	2·2	90·6
Central	115	3·83	5·2	88·7
St. George's	240	4·00	7·9	87·1
Cheetham	262	7·04	3·4	83·6
Crumpsall	77	8·70	5·2	87·0
Blackley	36	4·05	...	69·4
Harpurhey	98	6·17	7·1	73·5
Moston	62	5·10	...	80·6
Newton Heath.........	206	5·08	4·9	77·7
Bradford	65	2·74	7·7	86·1
Beswick	37	3·17	13·5	89·2
Clayton	44	5·31	4·5	86·4
Ardwick	191	4·61	7·9	84·8
Openshaw..............	198	7·24	3·5	84·8
Gorton (West)	104	3·53	1·9	80·8
Rusholme and Kirk.	172	8·37	1·7	67·4
Chorlton-on-Medlock.	249	4·30	2·4	71·5
Hulme	397	5·89	5·0	88·4
City of Manchester	**2692**	**4·93**	**4·6**	**82·3**

† Corrected: the fatal cases are those actually occurring amongst the cases notified.

Table 4.

Scarlet Fever.—Number of attacks, of deaths, and case fatality per cent. at different ages, for the ten years 1891-1900, and for 1901.

Ages	1891-1900			1901		
	Attacks	Deaths	Case Fatality per cent.	Attacks	Deaths	Case Fatality per cent.
Under one year ...	246	53	21·6	34	3	8·8
1 to 2 years ...	773	149	19·3	77	9	11·7
2 to 3 ,, ...	1,399	206	14·7	142	19	13·4
3 to 4 ,, ...	1,874	229	12·2	223	27	12·1
4 to 5 ,, ...	2,009	174	8·7	280	27	9·6
5 to 6 ,, ...	1,931	110	5·7	278	10	3·6
6 to 7 ,, ...	1,704	77	4·5	256	8	3·1
7 to 8 ,, ...	1,533	52	3·4	218	8	3·7
8 to 9 ,, ...	1,236	27	2·2	177	1	0·6
9 to 10 ,, ...	1,014	22	2·2	188	1	0·6
10 to 15 ,, ...	2,921	51	1·7	514	8	1·6
15 to 20 ,, ...	921	26	2·8	152	1	0·7
20 to 25 ,, ...	417	12	2·9	74	0	...
25 to 35 ,, ...	327	6	1·8	63	1	1·6
35 to 45 ,, ...	85	4	4·7	17	0	...
Over 45 ,, ...	32	1	3·1	6	0	...
All Ages	18422	1,199	6·5	2,692	123	4·6

Table 5.

Scarlet Fever Mortality, 1901.—Rate per 1000 living, compared with mean of five years.

	1896	1897	1898	1899	1900	Mean	1901
England and Wales...........	0·18	0·15	0·11	0·12	0·11	**0·13**	0·13
33 Great Towns	0·22	0·18	0·14	0·13	0·13	**0·16**	0·17
London..........................	0·21	0·18	0·13	0·09	0·08	**0·14**	0·13
Manchester City...........	0·37	0·23	0·12	0·08	0·19	**0·20**	0·23
Manchester Township	0·41	0·27	0·11	0·08	0·16	**0·21**	0·24
North Manchester	0·24	0·29	0·12	0·09	0·24	**0·20**	0·25
South Manchester	0·41	0·17	0·12	0·09	0·18	**0·19**	0·22
67 Smaller Towns	0·20	0·15	0·10	0·12	0·12	**0·14**	0·14
Rural Districts..................	0·14	0·12	0·09	0·10	0·10	**0·11**	0·10

SCARLET FEVER AND SCHOOL INFECTION.

In previous Annual Reports I have given a full account of the manner in which the question of the spread of Scarlet Fever in schools has been attacked, and the conditions under which a probable conclusion has been arrived at. The same procedure has been adopted for 1901, and the results arrived at are set forth in the following summary. For each school the department invaded is given, and the period during which the disease appeared to spread in the school. The mark * indicates marked invasion, the mark * * severe invasion. It will be seen that the schools in Openshaw were attacked in a specially severe manner :—

1901.

Holy Name Roman Catholic, Burlington Street. October and November—Girls.

St. Luke's Church of England, Newton Heath. April, May, and June—Infants.

*St. Michael's Board School, Hulme. January, February, March—Girls.

*Mulberry Street Board School, Hulme. January, February, March, and again in August, September—both Infants.

Mount Carmel Roman Catholic, Blackley. June—Infants ; slight.

Ross Place Board School. August, September, October—Infants ; slight.

Jews' School, Derby Street, Cheetham. March—Girls ; July—Boys ; moderate.

St. Stephen's Board School, Hulme. November—Boys ; slight.

**Burgess Street Board School, Harpurhey. The extraordinary incidence on this school in 1900 on all classes was continued in a somewhat mitigated degree into 1901, and was marked throughout the year.

Wesleyan School, South Street, Longsight. Both mixed and infant departments affected in March and April ; moderate.

St. Ann's Roman Catholic, Ancoats. January and February, and again in September, October—Boys ; slight.

Birley Street Board School, Beswick. January and February, May, November—Infants ; October and November—Boys ; moderate.

*Southall Street, Jews. February, March, April, May, June, July—Infants.

*St. John's Church of England, Herbert Street, Cheetham. January, February, March, April—Infants ; well marked.

Holy Trinity Church of England, Rusholme. March—Mixed.

*St. Barnabas' Church of England, Openshaw. January, February, March, April, June, October—Infants.

Smedley Road Board School, Cheetham. September—Boys.

Ashton Old Road Board School, Openshaw. August and September—Mixed ; slight.

**Varna Street Board School, Openshaw. September, October, November, and December—Infants ; March, April, May, and June, again September, October, November, and December—Girls ; May and June, again October, November, and December—Boys.

Queen Street Board School, Bradford. January, February, and March—Infants, slight.

Armitage Street Board School, Ardwick. September, October, November, and December—Infants.

British School, Gill Street, Blackley. January, February, and March—Infants, slight.

St. Mark's Church of England, West Gorton. August and September—Infants, slight.

Grange Street Board School, Bradford. May, June, and July—Infants.

St. Philip's Church of England, Ancoats. May and June, and again September and October—Infants ; September and October—Girls, slight.

Higher Grade Board School, Ardwick. May and June—Infants.

St. Edmund's Roman Catholic, St. George's. February, April, and June—Infants.

St. Clement's Church of England, West Gorton. May and June—Infants.

Lloyd Street Board School, Hulme. January and February, again October, November, and December—Infants ; March, April, and May, again September, October, and November—Girls.

*Lees Street Board School, Openshaw. January, February, March, August, September, October, November, and December—Infants ; October and November—Boys.

Waterloo Road Board School. May, June, and July—Infants.

*Upper Jackson Street Board School, Hulme. October and November—Boys.

*St. Stephen's Church of England, Chorlton-on-Medlock. February, March, May, August, September, October, and November—Infants; April and May—Girls.

Openshaw Wesleyan. May, June, and July—Infants.

St. John's School, Gartside Street, Central. December—Infants.

*Webster Street Board School, Chorlton-on-Medlock. January, February, and March—Mixed; June—Mixed; June—Infants, severe; November—Infants.

St. George's Board School, St. George's. January and February, again April, May, and June—Mixed, slight.

St. Mary's Church of England, Hulme. October and November—Boys, slight.

St. Silas' Church of England, Ardwick. September, October, and November—Infants.

*St. Luke's Board School, Cheetham. January and February, again September and October—Mixed.

St. Philip's Church of England, Hulme. March, April, and May—Infants.

*St. Thomas's Board School, Crumpsall. May, June, and July—Mixed; November and December—Infants.

Ducie Avenue Board School, Chorlton-on-Medlock. May and June—Boys.

*Lees Street Board School, Openshaw. January, February, March, August, September, October, November, and December—Infants; October and November—Boys.

St. Thomas's Church of England. Red Bank. April, May—Infants.

St. James's, Rusholme. June—Infants.

Duke Street Board School, Hulme. January, February—Infants, slight.

St. Patrick's Roman Catholic, St. George's. August, September, October—Infants.

St. Augustine's Roman Catholic, Granby Row. November—Boys.

Holland Street Board School, Newton. March, April, May—Mixed. Seems incomplete.

St. Paul's Church of England, Chorlton-on-Medlock. May—Infants.

*Vine Street Board School, Hulme. March, April, May, June, August, September, October—Infants.

Ten Acre Lane Board School, Newton. September, October—Mixed.

Lightbowne Road, Church of England, Moston. May and June—Mixed.

St. John the Baptist Church of England, Hulme. June, September, and October—Infants.

St. Cross's Church of England, Clayton. April, May, June—Infants.

British School, Fallowfield. October—Mixed.

Hulme Hall Lane Board School, Newton. August, September, October, November—Infants.

St. Lawrence's Roman Catholic, Hulme. September, October, December—Infants.

BACTERIOLOGY OF SCARLET FEVER.

In the last four Annual Reports of the Medical Officer to the Local Government Board appear successive statements by Dr. Klein and Dr. M. H. Gordon on this subject. So far back as 1887 Dr. Klein described a streptococcus, which he believed to be probably the cause of Scarlet Fever. This he considers to be the same as the streptococcus conglomeratus described by Kurth in 1891, and during the last few years he has initiated an investigation into the characters and relations to Scarlet Fever of this streptococcus, which he has handed over to Dr. Gordon to complete. Only a few details need be given here, though there is a possibility that these investigations may prove of importance.

This organism has definite cultural and other characters. It has not been found in the urine of cases of Scarlet Fever, nor in the desquamated cuticle. It has been found at an early stage in the throat, cervical glands, blood, spleen, liver, and kidneys. It is fairly constant on scarlatinal tonsils, and is occasionally present in the nostrils of cases in course of treatment in the hospital. It has not been found in the discharges from the ears. It disappears occasionally after a few weeks stay in hospital and subsequently reappears.

It has clearly an intimate relation with Scarlet Fever, but, so far, it is not definitely accepted as the causative micro-organism of the disease.

If further experiments and inquiries should establish its right to be so regarded, it would appear from these researches that the infective matter of Scarlet Fever is early disseminated through the system. It is probable that it is deposited in the skin, and, having regard to the course of the disease, it is likely that, at all events in the early stage, the skin is infectious. Discharges from the throat and nose may be regarded as certainly infectious.

Having regard to the facts of return cases, it still appears to me probable that the source of the infection is generally to be found in recent cases brought into contact with the convalescent before discharge, and that it is stored up in the nasal passages. These investigations, however, would tend to throw this position into some degree of doubt, while not entirely incompatible with it, and rather suggest continued extrusion from the substance of the tonsils.

We must, however, interpret clinical and bacteriological results by a process of mutual comparison.

Dr. Gordon's last research is one of profound interest, whether the micro-organism which he has investigated prove to be the cause of Scarlet Fever or not.

DIPHTHERIA, MEMBRANOUS CROUP.

This is a disease which requires to be carefully watched. It has been comparatively prevalent in London for a number of years, and for some years also there have been a large number of cases in Sheffield. It varies in severity from a slight affection of the throat, which may altogether escape attention till some circumstance, such as infection of some other case, calls attention to it, to the most painful and fatal illness.

The number of very slight cases appears to be great.

It possesses, therefore, great advantages in creeping from person to person. It is, moreover, almost, if not quite, indistinguishable from Scarlet Fever in certain forms of both diseases. The utmost vigilance and skill are thus required on the part of the Medical Officers of Isolation Hospitals to prevent its introduction into Wards allocated to Scarlet Fever under the guise of Scarlet Fever.

The two diseases, not very infrequently, co-exist in the same person.

It thus becomes a troublesome problem how the two diseases are to be at once detected, and the cases isolated.

These complications in preventing the spread of Diphtheria both in and outside the hospital render it necessary to use every means available for ascertaining the nature of all cases notified to the office, and to trace, as well as possible, and verify, the occurrence of slight overlooked cases.

The bacteriological examination is, thus, only second in importance to the medical attendant's first opinion, and must be regarded, and is generally regarded by him as a valuable, and indeed a necessary adjuvant to his clinical opinion. To every Public Health Office it is now almost indispensable.

The great value of this examination lies in the answers which it can give to two questions, viz. : (1st) At the beginning of a case, is it possible to say that it is or that it is not a case of Diphtheria, and with what degree of precision? (2nd) Has a given case ceased, at a certain point in convalescence, to be a source of infection?

The facts relating to this matter in our books were collected last year, and were given in my Annual Report. So far as I could judge, I made allowance for discrepancies between the medical opinion and the bacteriological result.

Professor Delépine, however, believed that he could throw further and special light on these discrepancies in 1900, and prepared a report on the subject, which is of great scientific value, and is appended to this report. (See page 122.)

It still appears to me important, all the same, to give the view of the medical attendant on the subject, and I have therefore, for the year 1901, gone carefully through each case, and with the aid of one of the clerks, Mr. Ernest Dunks, carefully tabulated the cases so as to obtain accuracy. A synopsis has been made of the facts relating to each case giving a negative reaction, so that the necessary deductions can be made from the number of 95 negative cases occurring in the books.

As regards the cases from which specimens have not been taken, the facts are also recorded, with a view, if possible, to see why specimens were not taken. The fatality in these cases is enormous, and no doubt in a certain proportion of them it has been very difficult to obtain a specimen. But a fatal issue is no proof of Diphtheria, and there are cases of Scarlatina Anginosa and of Septic Sore Throat which are very difficult to distinguish from Diphtheria.

The facts relating to bacteriological diagnosis during 1901 are shown in the following tables :—

BACTERIOLOGICAL EXAMINATIONS, 1901.

Total Number of Examinations made	Cases occurring in the City of Manchester, examined Outside the Hospital			Cases occurring in the City of Manchester, examined Inside the Hospital		
	Positive	Negative—Medical Attendant adhered to his diagnosis	Negative—Medical Attendant accepted the diagnosis	Positive	Negative—Diagnosed Diphtheria	Negative—Diagnosed as other disease
1,121	171	44	310	72	*51	40

* The majority of these were taken too late for a reliable bacteriological examination.

Cases examined inside Hospital, but not for the diagnosis of patients admitted as Diphtheria from the City								Examined outside Hospital on recovery	
Post scarlatinal		On recovery		Cases from outside districts		Monsall staff			
Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
114	120	29	89	9	27	9	33	1	2

There are 426 cases entered in our books as Diphtheria. Of these, 338 appear in the above table, viz., positive cases 243, and negative cases 95. The remaining 88 were not examined.

These 426 cases are classified as follows, according to the districts in which they occurred, the months of the year, and the results of bacteriological examination. The relation of negative cases and those not subjected to examination, to positive cases in the same district, is thus easily made out.

1901.—DIPHTHERIA ATTACKS ARRANGED IN MONTHS. *

STATISTICAL DIVISIONS		January			February			March			April			May			June			July		
		+	–	○	+	–	○	+	–	○	+	–	○	+	–	○	+	–	○	+	–	○
City of Manchester......		25	14	17	29	9	7	10	3	6	14	9	7	22	9	5	17	6	11	31	8	9
I.—Manchester Township		2	1	5	7	1	1	5	...	1	4	1	2	4	3	2	4	3	1	4	...	...
II.—North Manchester ...		15	8	4	16	4	5	2	1	...	2	5	4	2	2	2	8	3	3	14	4	2
III.—South Manchester ...		8	5	8	6	4	1	3	2	5	8	3	1	9	4	1	5	...	7	13	4	7
I.	Ancoats	1	...	1	...	1	...	...	...	...	1	...	1	...	1	1	...	...	...	2	...	...
	Central	...	...	1	4	...	...	2	...	...	2	1	...	1	...	1	1	...	1	...	...	...
	St. George's	1	1	3	3	...	1	3	...	1	1	...	1	3	2	...	3	3	...	2	...	...
II.	Cheetham..............	2	1	1	...	1	...	...	...	...	1	2	1	3	...	1	5	1	1	1	...	1
	Crumpsall..............	...	1	...	...	1	...	...	...	...	1	...	...	1	1	...	1	...	1	4	...	...
	Blackley	2	1	1	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	2	1	...
	Harpurhey	9	1	1	4	1	2	...	1	...	...	...	...	...	...	1	...	1	1	...	...	...
	Moston	...	...	1	1	...	1	...	...	...	...	1	1	...	...	...	...	...	...	4	1	...
	Newton.................	...	...	...	1	...	1	...	...	...	...	...	...	2	...	...	1	...	...	...	...	...
	Bradford	1	4	...	7	...	...	1	...	...	...	...	1	2	1	...	...	1	...	1	...	...
	Beswick.................	...	...	...	1	...	...	...	...	...	...	2	...	1	...	...	1	...	...	...	2	1
	Clayton.................	1	...	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...
III.	Ardwick	...	2	2	1	...	...	...	...	1	1	...	...	2	...	...	...	...	1	4	1	2
	Openshaw..............	2	1	1	1	2	...	1	1	...	3	2	...	...	2	...	...	...	...	5	1	...
	West Gorton...........	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	1	...	2	3	...	2
	Rusholme and Kirk. .	...	...	1	1	...	...	...	...	1	2	...	...	1	...	...	...	...	...	...	1	...
	Chorlton-on-Medlock .	3	1	2	1	1	1	1	1	...	...	...	1	1	1	1	1	...	...	...	...	2
	Hulme	2	1	1	2	1	...	1	...	3	2	1	...	4	1	...	3	...	4	1	1	1

* + Indicates that the swabs revealed diphtheria bacilli. – That they did not do so. ○ That no examination was made.

1901.—DIPHTHERIA ATTACKS ARRANGED IN MONTHS *—*continued.*

STATISTICAL DIVISIONS	August			September			October			November			December			Totals		
	+	−	○	+	−	○	+	−	○	+	−	○	+	−	○	+	−	○
City of Manchester	23	2	4	19	7	7	26	9	5	20	16	7	7	3	3	243	95	88
I.—Manchester Township	2	...	...	2	1	2	6	...	1	5	2	1	1	1	...	46	13	16
II.—North Manchester	8	2	1	8	3	2	6	3	1	11	7	...	5	1	2	104	43	26
III.—South Manchester	13	...	3	9	3	3	14	6	3	4	7	6	1	1	1	93	39	46
I. Ancoats	1	...	...	1	...	1	1	...	...	1	...	...	...	...	...	8	2	4
I. Central	1	...	...	...	...	...	2	...	...	2	1	...	1	...	...	16	2	3
I. St. George's	...	...	...	1	1	1	3	...	1	2	1	1	...	1	...	22	9	9
II. Cheetham	...	...	...	4	...	...	1	1	...	7	4	...	5	...	1	29	10	6
II. Crumpsall	4	...	...	1	1	2	1	2	...	...	...	...	...	...	...	13	6	3
II. Blackley	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	5	3	3
II. Harpurhey	3	1	...	...	...	...	3	...	1	1	...	...	...	...	...	20	5	6
II. Moston	...	...	1	1	...	...	...	...	...	1	1	...	...	...	...	7	3	4
II. Newton	...	...	...	...	...	...	1	...	...	1	1	...	...	...	...	6	1	1
II. Bradford	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	12	8	1
II. Beswick	...	...	...	1	1	...	...	...	...	1	...	...	...	...	1	5	5	2
II. Clayton	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	7	2	...
III. Ardwick	7	...	2	1	...	1	4	1	1	...	...	2	1	1	...	21	5	12
III. Openshaw	3	...	...	4	...	...	1	...	...	...	...	...	...	...	...	20	9	1
III. West Gorton	1	...	...	...	1	1	4	...	...	1	4	2	...	...	...	12	5	8
III. Rusholme and Kirkmanshulme	2	...	...	2	...	...	3	1	...	1	...	...	...	...	1	12	2	3
III. Chorlton-on-Medlock	...	...	1	2	...	...	1	4	...	1	3	2	...	...	...	11	11	10
III. Hulme	...	...	...	...	2	1	1	...	2	1	...	...	...	...	...	17	7	12

* + Indicates that the swabs revealed diphtheria bacilli. − That they did not do so. ○ That no examination was made.

I have also made the following analysis of the 426 cases tabulated as above, showing the fatality in the different groups :—

CASES GIVING A POSITIVE REACTION.

Removed to Monsall—Bacilli			Left at home or taken elsewhere—Bacilli		
Ordinary form	Short form	Doubtful	Ordinary form	Short form	Doubtful
118	25	2	77	18	3

Total, 243.

The corresponding deaths were :—

16	2	0	7	1	0

Total, 26.

CASES GIVING A NEGATIVE REACTION.

Removed to Monsall	Not Removed
66	29

Total, 95.

The corresponding deaths were :—

9	5

Total, 14.

CASES IN WHICH NO SPECIMEN WAS TAKEN.

Removed to Monsall	Not Removed
43	45

Total, 88.

The corresponding deaths were :—

37	28

Total, 65.

Total cases :—426.
Total deaths :—105.

Before discussing the above tables it is important to consider the list of negative cases, and to eliminate those which appear not to be diphtheria.

The complete summary of cases giving a negative reaction, with such information as I possess regarding them, is as follows :—

NEGATIVE CASES.

Negative Cases adhered to				Symptoms noted at the commencement of illness	Death	Ward	Remarks
No.	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken				
8	Dec. 31 +	Jan. 4, 1901	Jan. 20	December 31st, headache; January 1st, sore throat and severe vomiting	......	Bradford	Discharged Diphtheria ? Scarlet
10	Jan. 3	Jan. 7	Before removal Jan. 5	Onset gradual, lassitude, swollen neck	Jan. 17	Blackley	
14	Jan. 7 +	Jan. 9	Jan. 13	January 7th, suddenly complained of sore throat and headache	......	Bradford	? Scarlet
16	Jan. 1 +	Infirmary Jan. 1	Jan. 3	January 1st, sore throat and headache with vomiting	Jan. 5	St. George's	Notified Jan. 16 ? Scarlet
23	Jan. 10	0	Jan. 17	January 10th, headache and difficulty in swallowing. January 11th, some vomiting	......	Hulme	
31	Jan. 19 +	......	Jan. 21	Shivering, headache, vomiting on January 19th. Glands painful	Feb. 4	Openshaw	? Scarlet
33	Jan. 17	Jan. 22	Feb. 3	January 17th, headache and feverish; January 18th, sore throat; January 20th, sick and vomited	......	Bradford	Discharged Diphtheria
34	Jan. 5	0	Jan. 21	Ill Jan. 5th, languid and drowsy	Jan. 24	Ardwick	Letter from Doctor confirming diagnosis
41	Jan. 28 +	Jan. 29	Before removal Jan. 29	Suddenly ill with sore throat after nursing her baby, who also had sore throat	......	Chorlton-on-Medlock	? Verbal disagreement

NEGATIVE CASES—*continued*

No.	Negative Cases adhered to			Symptoms noted at the commencement of illness	Death	Ward	Remarks
	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken				
42	Jan. 17 + ...	0	......	Subject to tonsillitis; appeared as an aggravation of an ordinary attack	......	Crumpsall	?
43	Jan. 24 + ...	Jan. 28	Jan. 29	Symptoms of common catarrh...	......	Bradford	?
46	Jan. 22	Jan. 31	Jan. 30	January 22nd, headache and feverish; January 24th, sore throat	......	Harpurhey......	
51	Jan. 11 + ...	Medical attendant called in Jan. 29 0	Jan. 31	Very bad cold	......	Cheetham	......
53	Feb. 4 + ...	Medical attendant called in Feb. 4	Feb. 4 0	Not stated. Child taken ill. Sore throat	......	Cheetham	No reply to letter of enquiry
56	Feb. 1 + ...	Feb. 5	Feb. 10	February 1st, a cold. February 2nd, sore throat	......	Harpurhey......	Discharged Diphtheria
64	Feb. 4	Feb. 8	Before removal Feb. 6	Headache, sore throat, lumps in the neck	......	Clayton	Discharged Diphtheria
66	Feb. 7 + ...	0	Feb. 8	Bad cold, throat very sore	......	Hulme	Regarded as infectious
69	Feb. 5	0	Feb. 7 ....,...	Sore throat (brother)	......	Chorlton-upon-Medlock	Certified after negative result received. No reply
70	Feb. 7	Feb. 10	Feb. 10	Severe pain in the ears...........	......	Ancoats	Case 67. Brother

NEGATIVE CASES—*continued*

Negative Cases adhered to				Symptoms noted at the commencement of illness	Death	Ward	Remarks
No.	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken				
74	Feb. 8	Feb. 12	Feb. 18	Sudden onset. Very feverish, headache, swollen glands, February 8th. February 9th, throat sore, breath offensive. February 10th, vomited, and had difficulty in swallowing	April 13......	Openshaw	Death certified Diphtheria ? Septic
76	Feb. 11	Feb. 13	Feb. 18	Sore throat, headache, pain in back. Glands on right side swollen, breath offensive	......	Openshaw	Nursed his wife. Case 75 + (?)
78	Feb. 4 + ...	Feb. 14	Feb. 13	February 4th, sudden. Very ill, severe cold and cough. February 6th, pneumonia diagnosed	......	Crumpsall	Diphtheria first suggested Feb. 13 Discharged Diphtheria
86	Jan. 11	0	Jan. 14	Sore throat, feverish; diagnosed diphtheria. Went to school February 11th to February 14th. Died February 26th. Had signs of neuritis	Feb. 26	Ardwick.........	......
103	March 5 +	March 7......	March 13 ...	Feverish: throat slightly ulcerated, breath offensive	......	Openshaw	Discharged Diphtheria
111	March 10 +	March 12 ...	March 12 ...	March 10th. Mother thought the child was beginning with cramp, as its chest was affected. March 11th, chest and throat affected	......	Harpurhey......	Discharged Diphtheria

NEGATIVE CASES—*continued*

Negative Cases adhered to				Symptoms noted at the commencement of illness	Death	Ward	Remarks
No.	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken				
119	March 27 ...	0	......	March 27th, pains in the neck and feeling tired. Father and mother have had colds and sore throats during the week. Subsequently (May 15th) Dr. ——— states child has paralysis of the soft palate	......	Chorlton-on-Medlock	Little doubt
127	April 1 + ...	April 7	April 14......	April 1st, headache, sore throat. Got well; April 6th, throat again got ill	......	Hulme	Discharged Diphtheria
137	April 15 + ...	0	Apr 13......	Blisters on the roof of the mouth	April 16......	Beswick	Regards the case as infectious
141	April 17......	April 21......	......	April 17th, slight cold; April 18th, sore throat, cold much worse; April 19th, diagnosed croup	April 22......	Beswick	Death certified Diphtheria
142	April 17 + ...	0	April 23......	April 17th, limbs aching all over; April 18th, throat painful. Brother at 12 on March 30th had sore throat, and from him another child took diphtheria and died ??? +	......	Moston	No reply
144	April 23......	April 29......	April 27......	Recovering from whooping cough. Sister 145 +	May 2	Openshaw	Death certified Diphtheria

NEGATIVE CASES—*continued*

Negative Cases adhered to				Symptoms noted at the commencement of illness	Death	Ward	Remarks
No.	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken				
146	April 10......	0	April 24......	Sore throat, sleepiness, bad cold	May 25	Chorlton-on-Medlock	Notified May 29. Death certified Diphtheria
147	April 26......	0	April 29......	Gradual onset April 26th, tired; April 27th, vomited; April 28th, ill, headache, swollen neck, breathing bad	May 1	Central	Case 148, April 30. + Death certified Diphtheria
151	April 25......	May 1	April 29......	Pain in the throat and inability to swallow	......	Cheetham	Adheres
152	......	......	......	Four other cases : One — One 0 One + One +	 May 9 ...... April 29......		
157	April 27......	April 30	April 27......	April 27th, feverish, furred tongue; April 29th, vomiting. See 144 and 145	......	Openshaw	Two specimens — —
165	May 9	May 16	May 16	Headache, sickness	May 22	Bradford	Death certified Diphtheria
166	May 10	May 13	May 16	Croupy cough and feverish. Left glands swollen and and breath offensive on May 13th	......	Openshaw	Diagnosed Diphtheria

NEGATIVE CASES—*continued*

Negative Cases adhered to				Symptoms noted at the commencement of illness	Death	Ward	Remarks
No.	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken				
169	May 10 + ...	May 15	May 12	Cold, blisters inside the mouth and very offensive breath	May 15	St. George's ...	Death certified Diphtheria No reply
170	May 4	May 15	May 22	May 4th, glands began to swell. May 11th, feverish, throat coated	......	Openshaw	May 22 Discharged Diphtheria
180	May 25 + ...	May 29	June 16	Pains in head, face, back, and limbs; sore throat, vomiting. See case 171	......	St. George's ...	Discharged Diphtheria
181	May 26 + ..	May 30	May 30	Headache on May 26th. Rash on May 28th	......	Ancoats	Discharged Diphtheria
186	May 30	June 1	June 16	May 30th, feverish and fretful. May 31st, sore throat. Mother 185 +	......	Hulme	Discharged Diphtheria
189	June 2 + ...	June 3	June 16	Headache, croupy cough, and vomiting	......	St. George's ...	Discharged Diphtheria
191	June 3	June 5	June 5	Headache	June 9	St. George's ...	Discharged Diphtheria
192	June 5 + ...	June 5	June 16	Vomiting, flushed, sore throat...	......	Harpurhey......	Discharged Diphtheria

NEGATIVE CASES—*continued*

Negative Cases adhered to							
No.	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken	Symptoms noted at the commencement of illness	Death	Ward	Remarks
193	June 4 + ...	June 5	June 16	Sore throat, vomiting, sick headache. June 5th, difficulty in swallowing	......	Bradford	Discharged Diphtheria
199	June 10	June 15	June 16	Feverish, loss of appetite. June 12th, sore throat, which gradually grew worse, till unable to swallow.	......	Cheetham	Discharged Diphtheria
203	May 21 + ...	0	May 21	Pain in throat. Treats as if bact. exam. had been otherwise	......	Crumpsall	At the end of 4 weeks had Nephritis. Scarlet?
209	June 26 + ...	June 26	July 7	Headache, lump in throat, pain in leg	......	St. George's ...	
234	July 5 + ...	July 6	July 10	Headache, sore throat, and sickness	July 10	Rusholme	Brother returned from Hospital 3 days previous, having had Scarlet Fever and nasal discharge after return

Negative Cases adhered to				Symptoms noted at the commencement of illness	Death	Ward	Remarks
No.	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken				
244	July 12 + ...	July 12	July 23	Vomiting, feverish, and had a discharge from nose and mouth	......	Beswick	
256	July 14 + ...	July 20	July 25	Very tired, headache, pain in throat	......	Beswick	
259	July 16 + ...	0	July 24 0	Taken sick and ill. July 17th, throat swollen	......	Openshaw	July 16, opened a very foul drain. "S. after to disinfect"
271	July 24	0	July 28	Neck observed to be swollen, throat patchy	......	Blackley.........	? ?
277	July 27 + ...	July 29	Aug. 4	Illness sudden. Headache, sick, sore throat	......	Ardwick.........	? Scarlet
279	July 26	0	Aug. 1	Lumps in neck, nasal discharge	......	Moston	Verbal
283	July 28 + ..	Aug. 5	Aug. 11	Wet, severe cold. August 1st, sore throat	......	Hulme	
288	Aug. 10	0	Aug. 16	Pain in neck	......	Harpurhey......	Verbal (?)
289	Aug. 10 + ...	Aug. 18	Aug. 21	Earache, severe illness	......	Blackley.........	

NEGATIVE CASES—*continued*

Negative Cases adhered to				Symptoms noted at the commencement of illness	Death	Ward	Remarks
No.	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken				
327	Sept. 12 + ...	Sept. 16	Sept. 20	Headache, sore throat, pain in side.	......	Beswick	
328	Sept. 13......	Sept. 17......	Sept. 18......	Sick and headache followed by sore throat and vomiting	......	Hulme	? Scarlet
329	Sept. 15+ ...	0	Sept. 25......	Sore throat and langour	......	Clayton	"Delayed specimen" Verbal disagreement
332	Sept. 16......	0	Sept. 20......	Cold in head. September 17, throat swollen, feverish	......	West Gorton....	Verbal disagreement
338	Sept. 24+ ...	Sept. 27......	Oct. 6	Sickness, headache, sore throat	......	St. George's.....	? Scarlet
342	Sept. 29	Sept. 29......	Oct. 6	Felt sick, throat swollen	......	Crumpsall	See 335-6. Not examined
345	Oct. 3	Oct. 3	Oct. 6	Vomiting and sore throat	......	Crumpsall	Case 335-6-342 ? Scarlet
346	Sept. 30......	Oct. 3	Oct. 6	Suddenly taken ill, sick and vomiting, sore throat	......	Hulme	? Scarlet
351	Oct. 4	Oct. 7	Oct. 9	Cough and hoarseness following Measles	......	Cheetham	

NEGATIVE CASES—*continued*

No.	Negative Cases adhered to			Symptoms noted at the commencement of illness	Death	Ward	Remarks
	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken				
352	Oct. 4	Oct. 7	Oct. 9	Headache, bad cold, sore throat	......	Rusholme	
354	Oct. 8	Oct. 8	Oct. 13	Feverish, sore throat..............	......	Crumpsall	
360	Oct. 13	Oct. 14	Oct. 16	Sudden, with sore throat	......	Chorlton-on-Medlock	
382	Oct. 23	Oct. 24	Oct. 27	Sore throat, pains in head	......	Chorlton-on-Medlock	
387	Oct. 31	Nov. 1	Nov 3	Pain in throat	......	Chorlton-on-Medlock	? ?
390	Oct. 27+ ...	Nov. 11	Nov. 28	Languid, headache, vomiting ...	......	Ardwick	
392	Oct. 29+ ...	0	Nov. 2 0	Feeling sickly, headache. November 1st, severe pain in throat	......	Chorlton-on-Medlock	"Specimen not good"
396	Nov. 4	0	Nov. 7	Cold in throat, difficulty in breathing	Nov. 8	Cheetham	Death certified diphtheria, Monsall
401	Nov. 11......	Nov. 11......	Nov. 17......	Throat swelled, cold in the head	......	Central	......

NEGATIVE CASES—*continued*

Negative Cases adhered to				Symptoms noted at the commencement of illness	Death	Ward	Remarks
No.	Illness began	Date of removal to Monsall Hospital	Date on which specimen was takan				
405	Nov. 5	0	Nov. 9	Bad cold, croupy cough	......	Chorlton-on-Medlock	"Almost certain."
410	Nov. 7	Nov. 14......	Nov. 8	....	......	Cheetham	(See case 402) + Second specimen Nov. 24. (Involution forms) third. 'Has no doubt.'
414	Nov. 14......	Nov. 15......	Nov. 20......	Very ill and very hot November 15th, sore throat	......	Cheetham	......
415	Nov. 9 + ...	Nov. 15......	Nov. 20......	Sore throat	......	Chorlton-on-Medlock	......
416	Nov. 4 + ...	Nov. 16......	Nov. 20......	Pains in head November 6th, sore throat, difficulty in swallowing	......	West Gorton ...	......
418	Nov. 13......	Nov. 16......	Nov. 20......	Headache, sore throat, difficulty in swallowing	......	West Gorton ...	See 416, 417 – 0
419	Nov. 9 + ...	0	Nov. 16...... 0	Pain in eye socket and roof of mouth	......	West Gorton ...	No reply. ??
420	Nov. 14+...	Nov. 17......	Nov. 28......	Sore throat	......	St. George's ...	......

Negative Cases adhered to				Symptoms noted at the commencement of illness	Death	Ward	Remarks
No.	Illness began	Date of removal to Monsall Hospital	Date on which specimen was taken				
427	Nov. 23+...	Nov. 25......	Dec. 8	After a cold was languid, and had slight sore throat	......	West Gorton ...	......
429	Nov. 19+...	0	Nov. 26.. ... 0	Slight sore throat, headache, difficulty in swallowing	......	Bradford	No reply
430	Nov. 26......	Nov. 28......	Dec. 2	Illness sudden, fainting afterwards, headache, sore throat	......	Moston	......
431	Nov. 29......	Dec. 2	Dec. 2	Swollen tonsils, headache, vomiting, bad throat, very feverish	......	Cheetham	Two negative specimens (see 436 and 442 +)
437	Dec. 2	Dec. 4	Dec. 5	Sore throat and vomiting.........	......	St. George's ...	......
440	Nov. 21+...	0	Nov. 22.....	Bad cold, feverishness, langour..	......	Chorlton-on-Medlock	"Imperfect specimen"
446	Dec. 8	0	Dec. 10......	Swelled neck and glands, headache, sore throat	......	Bradford	......
449	Nov. 29......	0	Dec. 15......	Bad cold ....…	......	Newton	No reply. ???
451	Dec. 25......	Dec. 28......	Jan. 2.........	Sore throat, croupy	......	Ardwick	......

Applying the tests usually employed to eliminate negative cases as not Diphtheria, that the medical attendant does not sustain the diagnosis of Diphtheria, or that the disease is clearly of another nature, we put aside 13 cases, viz. :—53, 66, 137, 142, 169, 181, 203, 234, 259, 392, 419, 429, 440.

In addition to these, there are 32 cases in which examination was delayed : in 6 cases 8 or 9 days after commencement of the illness, in 26 cases 10 days and upwards.

The following cases appeared from the history of onset obtained by the Inspectors not to be Diphtheria :—8, 14, 16, 31, 41, 42, 43, 51, 74, 78, 180, 192, 193.

In other cases, the history is not sufficiently definite to enable one to form an opinion. The fact that the cases are discharged as Diphtheria from the hospital is quite inconclusive, as this procedure is rendered necessary by administrative considerations.

It may, however, be possible to obtain some further light from the hospital records. Dr. Gordon has kindly examined the records of the hospital, and finds that in the following numbers the diagnosis of Diphtheria was doubtful :— 76, 157, 166, 180, 191, 209, 327, 338, 354, 360, 387, 414, 418.

Other facts, not in my possession, are collected by Professor Delépine on the labels of the specimens. Besides these clinical facts, there are also the bacteriological examinations, of which he has made so skilful a use. I have, therefore, referred to him the list of negative cases entire, and also relieved of the cases which I consider from the evidence at my disposal should not properly appear on it. But the consideration of these cases entails much labour, and his statement on these will not be in time for this year's report.

It is impossible not to dwell on the rapid increase of cases giving a negative reaction, in which the medical attendant has maintained his diagnosis, in the last two years. There is no reason to suppose that this is in any way due to diminished care in making bacteriological examinations. It seems to be due rather to the different manner in which throat affections have come to be viewed, and it becomes necessary, therefore, to subject these to all the revision possible.

As a result of the above analysis, 52 cases disappear from the list of 95 as not properly bringing the bacteriological result in question.

There still remain 43 cases which require to be more carefully scrutinised, but, as already mentioned, I have not sufficient data on which to give any opinion at all upon these.

With regard to the 88 cases in which no samples have been taken, I have made a similar summary of these.

A small proportion of them appear to be cases of Scarlet Fever, but the means of forming an opinion are in general inadequate. The summary is, therefore, not reproduced. It is, however, of the very utmost consequence that such cases should be examined. Otherwise all figures relating to the effect of treatment, as with anti-toxic serum, are comparatively valueless, and it would be difficult to overrate the importance of such statistics. Moreover, general statistics do not altogether suffice, as each man has his own ideas about the best method of using the treatment.

The history of infection of cases of Diphtheria is as follows, with the same notation as before : + A case giving a positive result on bacteriological examination ; – giving a negative result ; 0 no specimen taken :—

			Number of cases				Number of cases
+	Infected from	+	12	–	Infected from	+	4
+	,,	+ ?	2	–	,,	+ ?	1
+	,,	–	4	–	,,	–	3
+	,,	0	4	–	,,	0	3
+	,, overlooked	0	1	–	,, Croup	0	0
+	,, Croup		1	–	,, overlooked	0	3
				–	,,	?	1
	Total.........		24		Total.........		15

			Number of cases
0	Infected from	+	4
0	,,	+ ?	0
0	,,	–	2
0	,,	0	0
0	,, Croup		0
0	,, overlooked	0	1
0	,, Scarlet Fever		1
	Total..................		1

Reverting now to the tables, we see from the total figures for different months that, if we rely only on the positive results, there is no great difference between one period of the year and another, and if we follow the course of the disease in different districts we find that it has a tendency to flare up now in one, now in another district, but that no seasonal incidence is manifest.

Thus, in Cheetham, 12 out of a total of 29 cases during the year occur in November and December; in Crumpsall, 8 out of 13 occur in July and August; in Harpurhey, 13 out of 20 occur in January and February; in Moston, 4 out of 7 occur in July; in Bradford, 7 out of 12 occur in February; in Ardwick, 16 out of 21 occur in July, August, September, and October; in Openshaw, 12 out of 20 occur in July, August, and September; in Hulme, 9 out of 17 occur in April, May, and June.

This is the behaviour of a disease which is propagated from person to person, not easily, but which, owing perhaps to a special infectivity in certain individuals, or at all events under some favourable circumstances, becomes from time to time actively infective.

As regards order of incidence, Crumpsall, and Harpurhey were most severely attacked; then, in descending order, Clayton, Cheetham, Openshaw, Moston, Bradford. This it will be observed is not widely different from the order in which Scarlet Fever occurs, and there is certainly an increasing tendency towards the combination of these two diseases, as well as to exchange of diagnosis. This is a condition of affairs which requires close attention, and which is peculiarly favourable to the increase of Diphtheria. The special incidence on Harpurhey is, perhaps, explicable as a school influence.

Newton Heath shows a quite remarkable smallness of incidence, a fact possibly owing to the great vigilance of the practitioners in that district.

As regards the order in which negative cases, in which the diagnosis of Diphtheria is maintained, occur, Beswick has the highest proportion. The following then come close together: Crumpsall, Harpurhey, Bradford, and Openshaw, followed by Cheetham.

The districts in which the largest proportion of cases not examined occurred were Crumpsall, Blackley, Harpurhey, and Moston.

Passing now to the fatality of cases, we find that of 118 positive cases treated in Monsall 16 died, while of 77 left at home 7 died, or 13·6 per cent. and 9·1 per cent. respectively.

Amongst negative cases treated in the hospital, the fatality was 13·6 per cent.; amongst those treated at home, 17·2 per cent.

Amongst cases not examined, the fatality at the hospital was 86·04 per cent.; amongst those treated at home, 62·2 per cent. These figures sufficiently illustrate these two points: (1) the necessity of promptly taking specimens for examination at the hospital should the patient be admitted without such an examination having been made, (2) the need of examining all cases if possible.

The bacteriological facts for Membranous Croup for 1901 are shown in the following table:—

1901.—MEMBRANOUS CROUP ATTACKS.

	STATISTICAL DIVISIONS.	+	−	○
	City of Manchester	5	5	24
I.	Manchester Township	2	...	2
II.	North Manchester	2	2	10
III.	South Manchester	1	3	12
I.	Ancoats	1	...	1
	Central	1	...	...
	St. George's	...	...	1
II.	Cheetham	...	...	...
	Crumpsall	...	...	...
	Blackley	1	...	...
	Harpurhey	...	1	2
	Moston	...	...	...
	Newton	1	1	1
	Bradford	...	...	7
	Beswick	...	...	...
	Clayton	...	...	...
III.	Ardwick	1	1	3
	Openshaw	...	...	...
	West Gorton	...	...	1
	Rusholme and Kirkmanshulme	...	...	...
	Chorlton-upon-Medlock	...	...	6
	Hulme	...	2	2

On comparing this with the corresponding table for Diphtheria it will be seen that there is no correspondence between the incidence on districts of Membranous Croup and other forms of Diphtheria. The numbers are small.

Yet strong reasons have been given why we should regard these cases as mostly true Diphtheria, even in the absence of a bacteriological examination.

The usual tables relating to Diphtheria and Membranous Croup are herewith submitted, and show the following facts :

The mortality from Diphtheria and Membranous Croup is still under that for England and Wales, and still further is it below that in the 33 great towns and in London. But it is creeping up. The death-rate from this cause reached its lowest point in 1897, when it was only 0·08 per 1000. It is in 1901 precisely three times as great. In North Manchester there is a slight decrease in the incidence as compared with 1900, but the fatality has increased. In the other two divisions of the city a marked increase has occurred. It may be that it is being transferred from North Manchester to the other two divisions.

The incidence of the disease was especially marked in the first and third quarters of the year. The table showing for the whole city the number of cases at different ages, and the fatality at those ages, indicates that the greatest number of cases occurs from ages 1 to 5. The disease is most fatal in infancy, and shows a diminishing virulence up to the age of 45.

The proportion of cases removed to Monsall in 1901, viz., 57·2 per cent., was in advance of that for any previous year. The districts most severely affected in 1901, so far as this can be shown by incidence rates, were Crumpsall, Harpurhey, Blackley, and Cheetham in North Manchester ; less severely, Bradford, Beswick, Ardwick, and Openshaw.

SPREAD OF DIPHTHERIA IN SCHOOLS IN 1901.

There is reason to believe that Diphtheria was propagated in school in 1901 in the following schools, but in none to a serious extent, except, perhaps, in Burgess Street Board School :—

St. John's School, Gartside Street, Deansgate. February—Infants ; 3 cases.

Clarendon Road Board School, Crumpsall. June, July—Infants ; 4 cases.

St. Thomas's Board School, Crumpsall. August, September, October—Infants ; 6 cases. Of these, one gave a negative result, and in one no specimen was taken.

Smedley Road Board School, Cheetham. November—Infants; 3 cases. One of these gave a negative result, and was probably not Diphtheria.

Ashton Old Road Board School, Openshaw. January, February, March—5 cases. One belated specimen, negative. In another, treated for quinsy, no specimen was taken. In still another, the specimen was negative. It is, therefore, doubtful whether in this instance Diphtheria spread in the school.

Armitage Street Board School. August and October—Infants; 4 cases. In one of these the bacteriologal examination gave a negative result.

Birley Street Board School. June, July—Infants; 3 cases. In two of these no specimen was taken, and in one the diagnosis was doubtful.

Burgess Street Board School, Hurpurhey. January, February, March—Infants; 9 cases. Of these, one case gave a negative result, and one was not examined.

The following are the tables relating to Diphtheria and Membranous Croup during the year 1901:—

DIPHTHERIA, MEMB. CROUP, 1901.—ATTACKS IN WEEKS, ACCORDING TO DATE OF ONSET.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 5	12	April 6	9	July 6	20	Oct. 5	11
,, 12	12	,, 13	10	,, 13	12	,, 12	8
,, 19	13	,, 20	3	,, 20	10	,, 19	15
,, 26	9	,, 27	9	,, 27	14	,, 26	3
Feb. 2	16	May 4	9	Aug. 3	5	Nov. 2	11
,, 9	19	,, 11	10	,, 10	5	,, 9	17
,, 16	8	,, 18	5	,, 17	3	,, 16	12
,, 23	9	,, 25	7	,, 24	10	,, 23	6
Mch. 2	11	June 1	9	,, 31	11	,, 30	8
,, 9	8	,, 8	7	Sept. 7	7	Dec. 7	8
,, 16	6	,, 15	4	,, 14	6	,, 14	3
,, 23	1	,, 22	6	,, 21	10	,, 21	0
,, 30	5	,, 29	11	,, 28	10	,, 28	4
Total...	129	Total...	99	Total...	123	Total...	106

City total, 457.

Diphtheria and Memb. Croup Attacks, 1901.—Rates per 1000 living, compared with mean of five years.

	1896	1897	1898	1899	1900	Mean	1901
Twelve Notification Towns ...	0·62	0·58	0·85	2·06	1·89	**1·20**	1·67
City of Manchester	0·44	0·29	0·36	0·45	0·62	**0·43**	0·84
Manchester Township.........	0·32	0·22	0·20	0·31	0·34	**0·28**	0·58
North Manchester	0·67	0·37	0·70	0·81	1·14	**0·74**	1·10
South Manchester	0·39	0·26	0·26	0·33	0·44	**0·34**	0·79

Diphtheria, Memb. Croup, 1901.—Number of Attacks, of Deaths, and Case Fatality at Different Ages, for the Ten Years 1891-1900, and for 1901.

	1891-1900			1901		
Ages	Attacks	Deaths	Case Fatality*	Attacks	Deaths	Case Fatality*
Under one year ...	114	84	73·8	13	8	61·6
1 to 2 years ...	311	200	64·3	28	18	64·3
2 to 3 " ...	317	183	57·7	34	16	47·0
3 to 4 " ...	372	170	45·7	53	21	39.6
4 to 5 " ...	343	136	39·6	54	16	29·6
5 to 6 " ...	258	103	39·9	51	14	27·4
6 to 7 " ...	167	49	29·4	41	13	31·7
7 to 8 " ...	151	35	23·2	38	9	23·7
8 to 9 " ...	120	20	16·7	25	8	32·0
9 to 10 " ...	111	15	13·5	18	4	22·2
10 to 15 " ...	368	26	7·1	37	0	...
15 to 20 " ...	282	15	5·3	20	1	5.0
20 to 25 " ...	234	7	3·0	14	2	14·3
25 to 35 " ...	296	11	3·7	22	2	9·1
35 to 45 " ...	145	4	2·8	6	0	...
Over 45 " ...	70	3	4·3	3	0	...
All ages	3659	1061	29·0	457	132	28·9

* The percentages in this column are the actual proportions of fatal cases to the attacks at those ages.

Diphtheria and Membranous Croup, 1901.—Attacks in Districts, with Attack Rate, Case Fatality per cent., and Removals to Hospital per cent.

Districts	Attacks	Attack Rate per 1000 living	† Case Fatality per cent.	Removals to Hospital per cent.
Ancoats	15	0·33	33·3	66·7
Central	22	0·73	27·3	81·8
St. George's	41	0·68	29·3	68·3
Cheetham	44	1·18	20·4	61·4
Crumpsall	21	2·37	22·7	68·2
Blackley	12	1·35	16·7	58·3
Harpurhey	33	2·08	24·2	54·5
Moston	14	1·15	28·6	7·1
Newton Heath	12	0·30	41·7	33·3
Bradford	28	1·18	28·6	60·7
Beswick	13	1·11	53·9	61·6
Clayton	8	0·97	...	37·5
Ardwick	43	1·04	30·2	55·8
Openshaw	29	1·06	13·4	79·3
Gorton (West)	26	0·88	42·3	53·8
Rusholme and Kirk.	17	0·83	23·5	52·9
Chorlton-on-Medlock	37	0·64	37·8	29·7
Hulme	42	0·62	35·7	59·5
City of Manchester	**457**	**0·84**	**28·8**	**57·2**

† Corrected: the fatal cases are those actually occurring amongst the cases notified.

Diphtheria, Memb. Croup Mortality, 1901.—Rate per 1000 living compared with mean of five years.

	1896	1897	1898	1899	1900	Mean	1901
England and Wales	0·29	0·24	0·24	0·29	0·27	**0·27**	0·27
33 Great Towns	0·38	0·31	0·31	0·40	0·35	**0·35**	0·30
London	0·60	0·51	0·40	0·43	0·34	**0·46**	0·30
Manchester City	0·15	0·08	0·09	0·16	0·19	**0·13**	0·24
Manchester Township	0·13	0·08	0·06	0·12	0·18	**0·11**	0·16
North Manchester	0·23	0·10	0·15	0·26	0·23	**0·19**	0·30
South Manchester	0·12	0·08	0·08	0·11	0·16	**0·11**	0·25
67 Smaller Towns	0·25	0·24	0·28	0·28	0·29	**0·27**	0·28
Rural Districts	0·23	0·19	0·18	0·21	0·23	**0·21**	0·24

BACTERIOLOGICAL REPORT ON DIPHTHERIA IN THE YEAR 1900, BY PROFESSOR DELÉPINE.

*

Bacteriological Laboratory,
Owens College,
December 10th, 1901.

Dear Dr. Niven,—According to my promise, I now send you a short account of the work done in my laboratory in connection with the diagnosis of Diphtheria during the year 1900, in order that you should be in a position to place the statements which I have made to you before the Chairman of the Sanitary Committee.

Summary Report on the bacteriological examination of products from cases of suspected Diphtheria occurring in Manchester during the year 1900.

Total number of examinations with general results.

During the year 1900 I have received from Manchester 1038 swabs obtained from cases of suspected Diphtheria.

These swabs were taken from	810 persons.
Belonging to about..........................	680 households.

From the notes available to me it is not possible, in some cases, to ascertain the exact address of patients admitted to hospital owing to the forms which I supply with the outfits not being properly filled, but the number of households do not probably exceed by more than 10 the number given above. By household, I mean a group of persons of the same name living at the same address (by adding persons of different names, the total number of households would be very slightly reduced).

Personal incidence.

Swabs obtained from those 810 persons supposed to be possibly affected with Diphtheria yielded the following results at one time or another :—

No Diphtheria bacilli present in..............	527	persons.
Diphtheria bacilli present in	276	,,
No satisfactory growth (doubtful results) ...	7	,,
	810	,,

Household incidence.

Swabs obtained from one or several persons belonging to 674 out of the 680 households mentioned above yielded the following results :—

No Diphtheria bacilli in	457	households.
Diphtheria bacilli in........................	217	,,
	674	,,

(N.B.—Owing to the doubtful results, six households cannot be included in the return.)

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* See Annual Report for the year 1900, p. 50.

It is impossible for me to take account of cases which have been returned as cases of Diphtheria, but which have not been submitted to bacteriological examination. An analysis of the examinations made in connection with 674 households yields the following figures:—

1.—HOUSEHOLDS FREE FROM DIPHTHERIA BACILLI, BUT WHERE SUSPICIOUS ILLNESS OCCURRED.

One person only affected in	426	households.
Two persons only affected in	26	,,
Three persons affected in	3	,,
Four persons affected in	1	household.
Five persons affected in	1.	,,
	457	households.

2.—HOUSEHOLDS IN WHICH DIPHTHERIA BACILLI WERE FOUND.

A—*No other cases than those infected with Diphtheria bacilli found by bacteriological examination.*

One person only affected in..............	161	households.
Two persons affected in	18	,,
Three persons affected in..................	1	household.
	180	households.

B—*Households in which some cases gave Positive and others Negative results.*

1 positive and 1 negative case	8
1 positive and 2 negative cases	21
2 positive and 1 negative case	2
3 positive and 2 negative cases	3
3 positive and 1 negative case	1
4 positive and 1 negative case	1
	36

Re-examinations and duration of infection in ositive cases.

In a number of cases more than one examination was made; in 82 of the cases in which Diphtheria bacilli were found information as to the date of onset of illness was obtainable. Out of the cases examined twice during the first ten days, only one giving a negative result on the first examination gave a positive result on second examination. All the other negative results of a first examination were confirmed by a second examination made during the first ten days.

A first positive result obtained during the first week was seldom followed by a second positive result when the second examination was made at least 12 or 14 days after the first.

When the second specimen was taken from 16 to 22 days after the first it almost always yielded a negative result.

There were, however, several exceptions to this general rule : these exceptions are summed up in the following table :—

Cases in which Diphtheria Bacilli were still present 16 days after a first positive examination made during the first week of illness :—

In 4 cases bacilli were present 16 days after first examination, and had disappeared 24 days after first examination.
In 1 case bacilli were present 18 days after first examination, and had disappeared 30 days after first examination.
In 2 cases bacilli were present 20 days after first examination, and had disappeared 28 to 32 days after first examination.
In 1 case bacilli were present 22 days after first examination, and had disappeared 32 days after first exmaination.
In 1 case bacilli were present 24 days after first examination, and had disappeared 32 days after first examination.
In 1 case bacilli were present 32 days after first examination, and had disappeared 39 days after first examination.

10

Therefore, in 10 positive cases out of 82, bacilli had persisted in the throat for more than 16 days after the first examination, which had on an average been made on the third or fourth day of the illness, so that these cases remained infectious for at least three weeks, some of them remaining infectious for four and five weeks.

These cases of re-examination have been selected from a much larger number, because the information regarding them was sufficiently definite and bore the stamp of accuracy. But the other cases not included in the above list gave indications of the same nature, though less definite.

Anginal areas

Various types of anginal outbreaks indicated by bacteriological examination.

In addition to the above intrinsic evidence of the accuracy of bacteriological diagnosis, I wish to state that we have had instances of whole series of cases coming from a limited area in which all or nearly all cases yielded either positive or negative results, indicating that in those areas which yielded negative results there must have existed outbreaks of disease simulating Diphtheria, but not identical with that disease. In several instances this opinion has been corroborated in part of the cases by subsequent statements supplied by the medical men attending the cases, our diagnosis not being, however, accepted by some other medical attendants. As our results are obtained without the slightest reference to locality or to the nature of symptoms, their uniformity in those groups of cases suggests a strong probability of their being correct.

Failures of bacteriological diagnosis.

There have been, however, instances of failure, and I am most anxious not to minimise their importance. I am, however, equally anxious to reduce them to their actual proportions.

Clinical disagreements

During the year 1900 not fewer than 81 expressions of disagreement with our negative results have at one time or another emanated either from the medical men attending the cases at their own home, or from the Superintendent of the Fever Hospital. In the latter case the disagreement was often more apparent than real, consisting simply of a notification which was sent to the Health Office for administrative purposes; in many cases the first opinion expressed was modified or revised afterwards. If there had actually been 81 failures out of a total of 810 cases, our error would have been equal to 10 per cent. of all cases examined; and as these errors would have related to negative cases only, of which there were 527, the error might have been said to amount to over 15 per cent., which is greatly in excess of what I have found by personal investigation to be the usual proportion of error. As the methods which I have adopted for official work in the laboratory have not been altered since 1894, and are carried out with an amount of care and experience increasing yearly, I felt convinced that many of the disagreements recorded in 1900 were not justified by the nature of the cases to which they related.

Dr. Niven has already shown in his report that this was actually the case, but I have thought it desirable to investigate the matter also from my own point of view.

Enquiry into Clinical disagreements.

I was much assisted in this matter by the documents furnished to me by Dr. Niven and by Dr. Marsden, who also kindly undertook to look through his notes of the cases, and express in a final manner whether the course taken by the cases examined bacteriologically was or was not in accordance with the bacteriological results.

As a result of this enquiry, I am now in a position to show that in a large proportion of cases of reported disagreement there was no disagreement at all; that in another group of cases, the clinical features of the case, although not justifying a complete agreement, did not indicate any satisfactory basis for disagreement. By the subtraction of these two groups the number of disagreements is considerably reduced.

ANALYSIS OF THE CASES ABOUT WHICH A DISAGREEMENT HAS BEEN REPORTED.

Subsequent Agreements.

A—*Cases in which a previous disagreement has given place to a final agreement on reconsideration of the course taken by the case:*

30, 39, 40, 81, 91, 117, 127, 134, 150, 166, 192, 196, 173, 208, 215, 221, 223, 226, 231, 239, 245, 251, 260, 265, 274, 282, 307.

Three of these cases were, in a much later communication, stated again to have been true cases of Diphtheria (150, 166, 173); but, on the other hand, a greater number of cases which previously had been reported as being certainly cases of Diphtheria have been subsequently stated to have been of a doubtful nature. Besides this, specimens 150 and 173 were collected respectively on the 28th and 26th day of the disease—*i.e.*, much too late to be of use for diagnostic purposes. Excluding 166, there remain 26 cases in this group.

Doubtful Disagreements.

B—*Cases in which there was either a doubtful agreement or a doubtful disagreement, and which cannot therefore be fairly regarded as indicating error in the bacteriological diagnosis.*

1.—In two of these cases (26 and 121) the specimens were collected on the 22nd and 23rd days respectively, and were taken too late for diagnostic purposes.

2.—In six other cases (4, 108, 154, 213, 258, 292) the mode of onset and symptoms indicated other forms of infection (generally Scarlet Fever) than Diphtherial infection.

3.—In six more cases (68, 83, 183, 219, 257, 119) the information obtainable was ambiguous in character.

As in all the above cases there was no absolute expression of disagreement, and as the cases were acknowledged to be of doubtful nature, they cannot be accepted as proving clearly error of bacteriological diagnosis.

4.—There were, however, three cases in this group (302, 69, and 297) in which, although the clinical diagnosis was not absolutely positive, there seems to me to have been some ground for the diagnosis of Diphtheria.

C—*Cases in which the bacteriological diagnosis was absolutely contradicted by the clinician.*

This group includes 36 cases, and, consisting of absolute disagreements, it requires a very careful consideration :—

Absolute Disagreements which are not material.

1.—In two instances the disagreement was the result of an error. Cases 120 and 141, which had been examined bacteriologically on the 8th and 4th day of illness with positive results, were examined again on the 29th and 20th day respectively as new cases, and, as could be expected, yielded negative results. It was therefore only as the result of an error in the clinical records that the bacteriological diagnosis was supposed to be negative.

2.—In five cases, 73, 115, 132, 204, 268 (to which cases 150 and 173 previously mentioned, see A, should be added) were useless specimens ; 115 was collected on the 22nd day, and 132 on the 36th day of the disease ; 204 was collected on the 10th day of illness, but 6 days after the beginning of treatment with antitoxin (this case also was probably a case of Scarlet Fever) ; 73 was a case of Membranous Croup, the child was dying, and the swab most probably did not reach the affected parts. In 268 the doctor says positively that the child would not let him take a specimen, and yet he sent the swab to be examined.

3.—In 9 cases (8 of which were young children or infants) the specimen was taken either when the patient was dying or shortly before death. In such cases there are two causes which interfere with bacteriological diagnosis. In the first place, a doctor does not like to disturb much a patient in such a critical state, and however important an accurate diagnosis may be for the protection of surrounding people he cannot always exercise the care necessary to obtain a reliable specimen. Secondly, the mouth is often occupied by a mass of decaying putrid products which cover the parts where the bacillus is to be found. Specimens taken from dying people are therefore often unreliable. In addition to this, 73 was affected with Membranous Croup, 76 was probably a case of Scarlet Fever, 79 was affected with Pneumonia, 262 had a Scarlatinal eruption, 220 was probably affected with Scarlet Fever, 278 was affected with Broncho-pneumonia. The only cases which were probably affected with Faucial Diphtheria were 57, 130, and 190. The above cases being excluded as being more or less unsuitable for bacteriological examination, there remain some 21 disagreements relating to cases from which reliable specimens were possibly, although not certainly, obtained.

4.—In two of these cases there is evidence to show that another infection than that of Diphtheria was probable. No. 50 had been clearly exposed to Scarlet Fever infection. No. 270 was actually suffering from Whooping Cough, in addition to which a satisfactory specimen could not be obtained.

5.—In five cases the mode of onset and the symptoms were unlike those of Diphtheria :

25 was probably Scarlet Fever.
97 was probably Scarlet Fever.
284 was probably Scarlet Fever.
308 was probably Scarlet Fever. In this case a definite rash is recorded.

185 The onset was like Scarlet Fever, but the patient had undoubtedly been exposed to Diphtheria infection. Other cases already excluded for reasons stated above could also be included in this group, viz., 76, 190, 204, 268.

Material absolute disagreement

6.—In nine cases the clinical information is not very definitely in favour of Diphtheria :

197
217
237 Possible source of Scarlet Fever infection.
249
275 Case of Broncho-pneumonia.
301 Possibly Scarlet Fever.
8
60 Slight sore throat. The patient was supposed to have been living in an infected house, but actually lived elsewhere (according to information provided at the time when the swabs were sent to the Laboratory).
177 Slight sore throat.

Except in case 60, there was no evidence of infection from other cases of Diphtheria ; and in case 60 the evidence was apparently erroneous.

7.—In five cases the evidence is distinctly in favour of Diphtheria infection, 55, 61, 137, 157, 172; but even in three of these cases the clinical evidence is not absolutely positive :

In 55 there were some doubts of Scarlet Fever.
In 137 the symptoms were indeterminate.
In 157 the clinical diagnosis remained doubtful.

Summary of Analysis of Disagreement.

The previous analysis may be summarised as follows :—

Excluding the 30 cases about which there was no real disagreement (A, B¹, C¹), there remain 51 cases, in 17 of which the clinical diagnosis is in doubtful agreement or disagreement with the bacteriological diagnosis, and 34 in which there is complete or absolute disagreement.

These 51 cases may be analysed as follows, on the basis of the facts which have been enumerated above:—

	Specimens bad or not suitable for accurate bacteriological examination		Clinical features of the case not supporting very strongly the Clinical diagnosis		Clinical features supporting the Clinical diagnosis
	A—Collected after end of 3rd week, or from parts not directly affected by disease	B—Collected from dying children	C—Other source of infection most probable, or symptoms indicating another disease	D—Clinical information very indefinite	E—
34 cases.	268	37	25	50	55
	132	(73) see A	(76) see B	270	61
	73	76	97	(115) see A	137
	204	79	185	197	157
	115	130	(190) see B	217	172
	...	190	(204) see A	237	...
	...	262	(268) see A	249	...
	...	178	284	275	...
	...	220	308	301	...
	...	...	...	8	...
	..	...	...	60	...
	...	...	...	177	...
	...	...	...	(220) see B	...
	=5	(9-1)=8	(9-4)=5	(13-2)=11	=5
17 cases.	26	...	4	68	302
	121	...	108	83	69
	...	...	154	183	297
	...	...	213	219	...
	...	...	258	257	...
	...	...	292	119	...
	2=2	...	6=6	6=6	3=3
otal 51	7	8	11	17	8

Analysis of Material Disagreements.

The cases which are of special importance are the 25 cases included in the columns D and E, *i.e.*, those in which the clinical features were either indefinite or supporting clearly the clinical diagnosis of these 25 cases. Eighteen are of special interest as being instances of absolute disagreement, not mitigated (except in two cases) by any of those conditions which have led me to eliminate other cases for purposes of discussion. I have carefully compared the results of the bacteriological investigation of swabs obtained from those cases, and find that, except with regard to four of them, there is no clear proof that the patients were suffering from Diphtheria; several were probably suffering from the effects of streptococcic or diplococci (probably pneumococcic) infection, singly or in combination with infection by some other pathogenic organisms than the Diphtheria bacillus.

The following is a summary of the information available regarding these cases. In recording the results of the bacteriological examination, only those organisms which attracted special attention by their number in the cultures are indicated. Several other kinds of organisms were, however, observed in many of these cases :—

ABSOLUTE DISAGREEMENT.

D—*Indefinite Clinical Evidence in favour of Diphtheria.*

NUMBERS		REMARKS ABOUT ONSET OR COURSE	RESULTS OF BACTERIOLOGICAL EXAMINATION (By cultivation in serum)					
Town Numbers	Laboratory Numbers		1 Diphtheria Bacilli	2 Staphylococci	3 Streptococci	4 Diplococci	5 Lanceolate-cocci	6 Yeasts
50	2115	Disease occurred a short time after the return of a boy who had been at Monsall suffering from Scarlet Fever. The only justification of the diagnosis given by the doctor is that "antitoxin acted like a charm," and that another child had just died in the house—two results which are equally compatible with Scarlet Fever and Diphtheria. The patient also developed Cardiac weakness afterwards, but this symptom is not uncommon after many febrile infectious diseases	–	+				
270	2874	The swab was reported not to have been properly taken. It may be doubted whether this case was one of Diphtheria. The patient was suffering from Whooping Cough when the throat symptoms appeared, but the cough was getting worse when the throat became suspicious This case has been included in this list because a brother was suffering from Diphtheria in the same house	–	+			+	
	2911						+	

ABSOLUTE DISAGREEMENT—*continued.*

NUMBERS		REMARKS ABOUT ONSET OR COURSE	RESULTS OF BACTERIOLOGICAL EXAMINATION (By cultivation in serum)					
Town Numbers	Laboratory Numbers		1 Diphtheria Bacilli	2 Staphylo-cocci	3 Streptococci	4 Diplococci	5 Lanceolate-cocci.	6 Yeasts
115	2497	No Clinical notes	–	+				+
		This case was one of seven all occurring in Berkeley Street, Strangeways, and all giving negative results :						
		2314 –	–	+			+	
		2428 (108) –	–	+	+	+		
		2496 –	–	+	+	+		
		2518 (121) –	–	+	+	+	+	
		2554 –	–		+			
		2689 –	–	+	+	+		
		It will be noticed that there is a great similarity in the results obtained in most of these cases, and that there were three disagreements in connection with this group. Two of these disagreements have, however, been eliminated on other grounds.						
197	2634	No material information........	–		+	+		
217	2717	Onset headache, second day marked Fever and sore throat. Two other cases in same street also negative :		+	+		+	
		2743 – (agreement)........	–	+		+	+	
		2729 –	–	+		+	+	

ABSOLUTE DISAGREEMENT—*continued.*

NUMBERS		REMARKS ABOUT ONSET OR COURSE	RESULTS OF BACTERIOLOGICAL EXAMINATION (By cultivation in serum)					
Town Numbers	Laboratory Numbers		1 Diphtheria Bacilli	2 Staphylococci	3 Streptococci	4 Diplococci	5 Lanceolate-cocci	6 Yeasts
237	2750	No material information	–	+	+			+
249	2785	No material clinical information	–	+	+	+		+
275	2873	No material clinical information	–	+	+	+	+	
301	2940	No material clinical information	–	+		+	+	+
8	1977	No material clinical information	–	+		+		
60	2189	Patient very liable to sore throat; present attack slight; symptoms indefinite. Several other patients of same family name were affected with Diphtheria, but lived in another part of the town	–	+	+	+		
		(See 61 lower down)						
177	2570	Membrane appeared on Thursday, disappeared on Monday; house full of children. None affected	–	+	+	+	+	
220	2695	No definite clinical information. Died 6 days after onset. Specimen collected on the 5th day	–	+	+	+	+	+

E—*Clinical Evidence favouring Diphtheria.*

NUMBERS		REMARKS ABOUT ONSET OR COURSE	RESULTS OF BACTERIOLOGICAL EXAMINATION (By cultivation in serum)					
Town Numbers	Laboratory Numbers		1 Diphtheria Bacilli	2 Staphylo-cocci	3 Streptococci	4 Diplococci	5 Lanceolate-cocci	6 Yeasts
55	2119—	Probably Diphtheria (Marsden)	—	+		+		
	2194—	Two other positive cases in the same place, one beginning one day earlier, and the other five days later:						
		2120 + Diph. Bacilli, long and short almost pure	+					
		2127 + Diph. Bacilli, short	+	+	+			
		Another negative case in same street:						
		2770 —	—	+	+		—	
61	2190—	Onset resembling that of Diphtheria	—	+				
		Three other cases occurring in same house are all positive:						
		2192 +	+					
		2210 +	+					
		2191 +	+					
		2191 fell ill three days before 2190, all very nearly at the same time. In this case the results of the bacteriological examination indicate that the culture test had not yielded a very good growth; and the evidence is very strongly against the accuracy of the bacteriological results						

ABSOLUTE DISAGREEMENT—*continued.*

NUMBERS		REMARKS ABOUT ONSET OR COURSE	RESULTS OF BACTERIOLOGICAL EXAMINATION (By cultivation in serum)					
Town Numbers	Laboratory Numbers		1 Diphtheria Bacilli	2 Staphylococci	3 Streptococci	4 Diplococci	5 Lanceolate-cocci	6 Yeasts
137	2480	No history (Staphylococcus pyogenes aureus and a small undetermined bacillus)	—	+				
	2609	One other case giving a positive result in the same house, and beginning five days later; 8 other cases of sore throat occurred in the same street, five of which gave positive results and three negative results						
		In same house: 2505 + Long and short Diph. bacilli, also short bacilli	+	+				
		In same street: 2490 + 2568 — 2493 + 2767 — 2532 + 2668 — 2534 + 2548 +						
		This case may probably be considered one of bacteriological failure. There were, however, small bacilli (other than the Diphtheria bacillus) in both cases, and these bacilli were very abundant in the negative one						

ABSOLUTE DISAGREEMENT—*continued.*

NUMBERS		REMARKS ABOUT ONSET OR COURSE	RESULTS OF BACTERIOLOGICAL EXAMINATION (By cultivation in serum)					
Town Numbers	Laboratory Numbers		1 Diphtheria Bacilli	2 Staphylococci	3 Streptococci	4 Diplococci	5 Lanceolate-cocci	6 Yeasts
157	2509	Clinical information indefinite. Original absolute disagreement not strongly maintained at a later date	–	+	+			
172	2568	No history. Specimen collected on the 15th day of illness. Another case giving positive results in the same house (2548); 10 other cases in the same street, 7 of which were positive and 3 negative	–	+			+	+
		2548 + Long Diphtheria B....................	+	+				
		The 10 other cases occurring in the same street gave the following results: 2493 + 2688 – 2532 + 2767 – 2534 + 2480 – 2494 + 2530 + 2505 + 2498 +						

Bacteriological results in cases of material absolute disagreements.

By excluding 4 cases which I believe to have been true cases of Diphtheria, there remain 14 cases, with the following bacteriological findings :—

	Staphylococci	Streptococci	Diplococci	Lanceolatecocci	Yeasts
Per 14 cases ……	12	11	7	6	6
Percentage………	85·4°/₀	78·5°/₀	50°/₀	43°/₀	43°/₀

Comparison of bacteria found in positive, negative, and doubtful cases :—

	Positive	Doubtful probable errors included	Doubtful after exclusion of probable errors	Negative
	Per cent.	Per cent.	Per cent.	Per cent.
2 Staphylococci ……	70	88·8	85·4	85·6
3 Streptococci ………	27	61·8	78·5	46·6
4 Diplococci…………	18	44·4	50	40·3
5 Lanceolatecocci …	16	38·8	43	34·8
6 Yeasts ……………	2·5	23	43	10 1

It is obvious that the presence of staphylococci has no diagnostic significance. On the other hand, the great preponderance of streptococci, lanceolatecocci, and yeasts in the cases which have been a source of divergence is remarkable. These organisms are all more abundant in the disputed cases than in the ordinary negative cases, about which there has been no difference of opinion. As the negative results include a large number of cases of slight anginas, not due to infection of a serious nature, it is obvious that organisms capable of producing severe anginas simulating faucial Diphtheria must appear to be less frequent in statistics relating to all negative cases than in those relating to cases simulating closely Diphtheria.

Graphic representation of results.

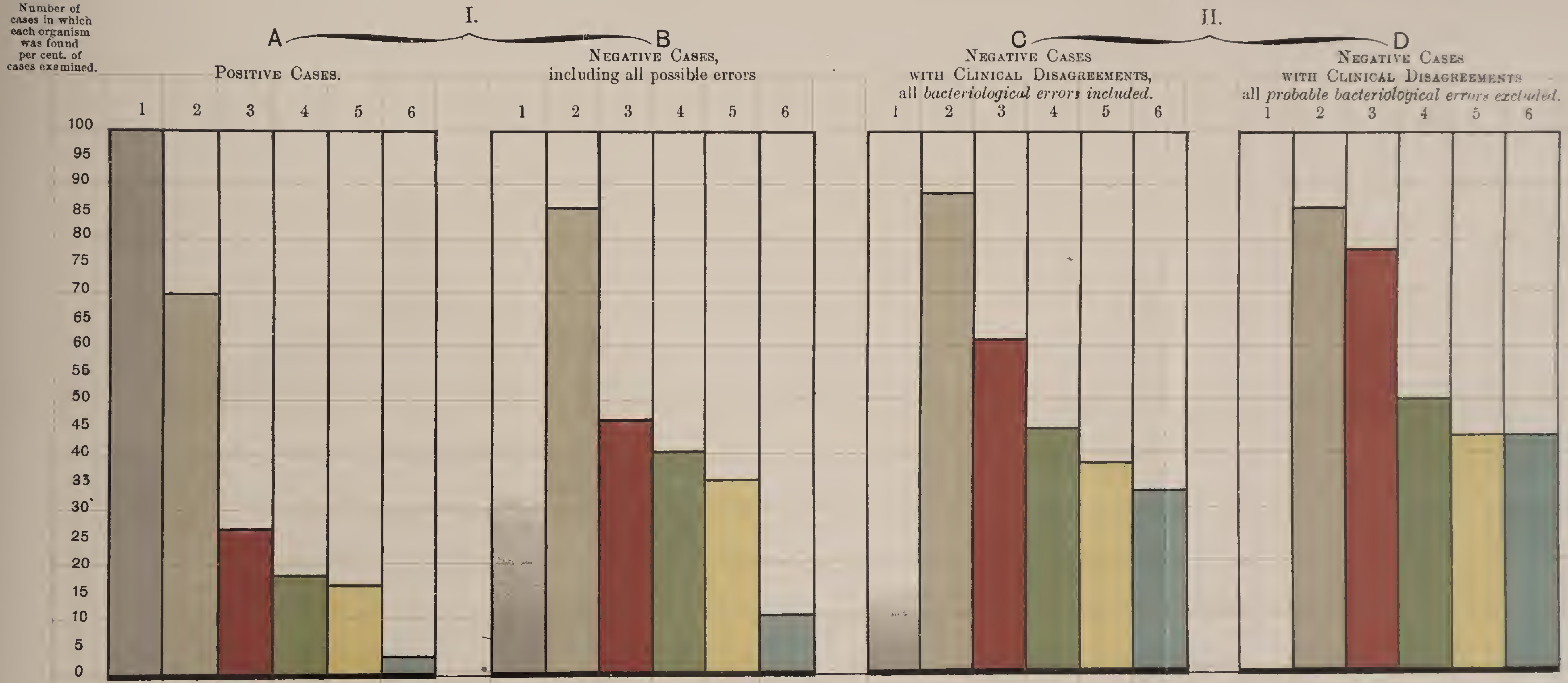
To render the meaning of the figures recorded in the preceding table more apparent, I have prepared 4 diagrams (A, B, C, D) corresponding to the 4 groups of cases indicated in the table.

In each diagram there are 6 columns, each corresponding to one of the bacteria which have been selected for comparison. The same colour is used to indicate the same microbe in the 4 diagrams. The height of each coloured column indicates the number of cases (out of 100 cases) in which each organism was found. It will be at once noticed that in negative cases streptococci, diplococci, and yeasts were found much more frequently than in the positive ones. The disproportion is greater still in those cases which have been a source of disagreement. This difference becomes still more remarkable when cases in which Diphtheria bacilli must have been present, though not detected, are excluded.

It seems, therefore, that cases of anginas, about which there has been disagreement, were more closely allied to the negative cases, about which there was no disagreement, than to the positive cases. The preponderance of streptococci indicates that frequently these debated cases were of septic nature.

I. Bacterial Associations in (A) Cases of Anginas due to Diphtheria, or in which Diphtheria Bacilli were found, compared with those observed in (B) Cases in which no Diphtheria Bacilli were found.

II. Bacterial Associations in Cases in which, although no Diphtheria Bacilli were found, a Clinical Diagnosis of Diphtheria was maintained. C All Cases of Disagreement included. D Cases of Disagreement which did not seem supported by substantial evidence.



Analysis of the results of cultivations from Cases of Suspected Diphtheria occurring in Manchester during the Year 1901,
1 Diphtheria Bacilli, 2 Staphylococci, 3 Streptococci, 4 Diplococci, 5 Lanceolaticocci, 6 Yeasts.
(Other organisms have been left out purposely.)

Mixed infections a probable source of error in some cases.

The presence of staphylococci, streptococci, pneumococci, even in large numbers, is not evidence that Diphtheria bacilli are not present. A glance at Diagram A will show that they are often found side by side. It is even probable that in some of the cases in which these organisms are in great preponderance, Diphtheria baccilli may have been present at one time or another without being found at the time of the bacteriological examination. In the throat, as elsewhere, conditions may be more favourable to the growth of one kind of organism than of another. I have noticed several families in which several members were affected with anginas. In some cases Diphtheria bacilli were present, in others not, but in all cases streptococci, or pneumococci, and sometimes yeast, were present. All these patients being ill nearly at the same time, it is probable that they had been exposed to the same kind of infection, but the results had been different owing to the predominance of one microbe in some cases and of another in the other cases. It is not, therefore, desirable to be dogmatic about the nature of all cases in which no Diphtheria bacilli are found. The fact, however, remains that in a very large proportion of the cases which are suspected of being cases of Diphtheria on clinical grounds no Diphtheria bacilli are found, and that the history and clinical features of the cases generally prove that the cases were not cases of Diphtheria.

General conclusions as to value of bacteriological examinations.

I have been for some years collecting data for the elucidation of the nature of the latter group of cases, and I hope to be in a position, shortly, to submit a report based on the first five years' work done in my department for the Manchester Corporation. The statements made in Dr. Niven's last report were, however, so important that I have thought it desirable to render available without delay some of the results of my investigations, leaving for the present other points for consideration in a more general report.

This interim report will show, I believe, that the precautions which I adopted in 1894 to insure the accuracy of the bacteriological diagnosis of Diphtheria have fulfilled their purpose, and that the moderate amount of error which I considered then almost unavoidable has not been exceeded since.

I feel more inclined than ever to doubt the reasonableness of a large proportion of disagreements. I wish also to urge that a greater amount of care than is sometimes exercised should be given to the collection of material for bacteriological examination.

Work of the Staff.

In conclusion, I wish to state that although I am responsible for the methods used, as well as the general system of investigation and collection of statistics, the accuracy of the results obtained has depended greatly on the care and devotion with which Dr. Sidebotham, Dr. Carver, Dr. Coutts, and Dr. Sellers have carried out their work. Dr. Carver, who has had charge of the majority of examinations connected with Diphtheria, is preparing a detailed account of the bacteriology of those cases. This report I will also submit to the Committee as soon as it is ready.

General conclusions.

A careful comparison of the clinical and bacteriological results leads me to the following conclusions :—

Out of 527 cases in which negative bacteriological results were obtained, there were 81 which gave rise to disagreement at first, but after further consideration the medical attendants accepted the bacteriological results in 30 of these cases, so that the total number of actual disagreements was 51.

For reasons which I have discussed, I consider that all the clinical evidence available shows that in 11 at least of these cases the history and clinical features supported strongly the bacteriological results. The number of material disagreements is thus reduced to 40.

In some cases the failure of the bacteriological test, if failure there was, must be attributed to the fact that specimens collected much too late, or otherwise unsuitable, had been sent for examination; this occurred in 7 instances. To this must be added many of the products collected from dying children (8 cases); by deducting these 15 cases, which were more or less unsuitable for examination, there remain 25 cases of serious material disagreement. In 17 of them, the clinical evidence is too unsatisfactory to allow one to offer an opinion as to their real nature. In the other 8 cases the clinical evidence is in favour of the disease having been Diphtheria.

To interpret the meaning of these results, it is necessary to exclude from the 527 cases the 15 which were not suitable for a reliable bacteriological examination. These cases indicate the limitations of bacteriology, but as it should generally be possible to obtain specimens for examination within the first week of the disease, and before the patient is moribund, this limitation is one which is not of serious practical importance.

This leaves for consideration 512 cases in which Diphtheria bacilli were not found. I have shown that in 8 of them Diphtheria bacilli were probably present, and that they were possibly overlooked in some 25 cases.

This indicates what may be considered as a certain error in about 1·5 per cent. of the cases yielding negative results, and a possible error in about 5 per cent. of all the negative cases.

By including positive as well as negative cases, these percentages would be reduced considerably.

If one considers that in some 800 cases there were symptoms pointing to the possibility of Diphtheria being present, and that in nearly 500 of them the bacteriological results relieved rapidly the patient, the medical attendant, and the sanitary authority of the anxieties and expenses connected with such a suspicion, it is obvious that even with its limitations the bacteriological diagnosis of Diphtheria is capable of yielding practical results of considerable importance.

SHERIDAN DELÉPINE.

ENTERIC FEVER.

The following are the tables referring to this disease :—

Enteric Fever Attacks Reported in Quarters.

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1891 …………	173	119	180	289
1892 …………	164	106	156	184
1893 …………	108	80	220	210
1894 …………	118	75	135	132
1895 …………	110	90	100	193
1896 …………	118	130	108	157
1897 …………	97	57	137	212
1898 …………	143	79	134	286
1899 …………	101	66	104	110
1900 ………	85	78	103	112
1901 …………	43	43	149	124

Enteric Fever Attacks in weeks reported in 1901, according to date of onset.

First Quarter		Second Quarter		Third Quarter		Fourth Quarter	
Jan. 5	4	April 6	2	July 6	1	Oct. 5	17
,, 12	3	,, 13	8	,, 13	2	,, 12	27
,, 19	3	,, 20	2	,, 20	3	,, 19	11
,, 26	3	,, 27	6	,, 27	7	,, 26	15
Feb. 2	3	May 4	2	Aug. 3	13	Nov. 2	9
,, 9	5	,, 11	4	,, 10	15	,, 9	9
,, 16	4	,, 18	1	,, 17	13	,, 16	9
,, 23	…	,, 25	2	,, 24	12	,, 23	6
Mch. 2	4	June 1	1	,, 31	13	,, 30	7
,, 9	2	,, 8	5	Sept. 7	22	Dec. 7	3
,, 16	2	,, 15	5	,, 14	14	,, 14	6
,, 23	4	,, 22	3	,, 21	20	,, 21	2
,, 30	6	,, 29	2	,, 28	14	,, 28	3
Total…	43	Total…	43	Total…	149	Total…	124

City Total … … … 359

ENTERIC FEVER ATTACKS, 1901.—RATES PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1896	1897	1898	1899	1900	Mean	1901
Twelve Notification Towns...	1·38	1·32	1·53	1·60	1·12	**1·39**	1·26
City of Manchester	0·95	0·94	1·19	0·70	0·70	**0·90**	0·66
Manchester Township.........	0·88	0·81	1·29	0·77	0·65	**0·88**	0·65
North Manchester	1·11	0·97	1·42	0·73	0·80	**1·01**	0·77
South Manchester	0·91	0·99	0·99	0·64	0·65	**0·84**	0·58

ENTERIC FEVER, 1901.—NUMBER OF ATTACKS IN DISTRICTS, WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1,000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats	40	0·89	20·0	77·5
Central	22	0·73	18·2	72·7
St. George's	26	0·43	26·9	61·5
Cheetham	17	0·46	11·8	47·1
Crumpsall	4	0·45	25·0	75·0
Blackley	2	0·23	50·0	...
Harpurhey	12	0·76	16·7	66·7
Moston	6	0·49	16·7	16·7
Newton Heath	34	0·84	11·8	58·8
Bradford	29	1·22	20·7	58·6
Beswick	8	0·68	25·0	75·0
Clayton	17	2·05	5·9	82·3
Ardwick	17	0·41	23·5	64·7
Openshaw	29	1·06	24·1	82·7
Gorton (West)	36	1·22	19·5	61·1
Rusholme and Kirk...	12	0·58	41·7	33·3
Chorlton-on-Medlock..	20	0·35	10·0	40·0
Hulme	28	0·42	25·0	39·3
City of Manchester.	**359**	**0·66**	**19·8**	**61·3**

† Corrected; the fatal cases are those actually occurring amongst the cases notified.

Enteric Fever.—Number of Attacks, of Deaths, and Case Fatality per cent. at Different Ages, for the Ten Years 1891–1900, and for 1901.

Ages	1891-1900			1901		
	Attacks	Deaths	Case Fatality per cent.	Attacks	Deaths	Case Fatality per cent.
Under one year ...	6	4	66·7	1	1	100·0
1 to 2 years ...	26	8	30·8	2	0	...
2 to 3 ,, ...	55	8	14·5	2	0	...
3 to 4 ,, ...	96	17	17·7	3	0	...
4 to 5 ,, ...	140	15	10·7	6	0	...
5 to 6 ,, ...	156	20	12·8	5	1	20·0
6 to 7 ,, ...	147	18	12·2	5	0	...
7 to 8 ,, ...	142	15	10·6	8	0	...
8 to 9 ,, ...	153	13	8·5	5	0	...
9 to 10 ,, ...	144	14	9·7	2	0	...
10 to 15 ,, ...	823	98	11·9	54	6	11·1
15 to 20 ,, ...	921	179	19·4	65	12	18·5
20 to 25 ,, ...	822	163	19·8	66	17	25·8
25 to 35 ,, ...	963	246	25·6	83	20	24·1
35 to 45 ,, ...	468	155	33·1	36	11	30·6
Over 45 ,, ...	297	112	37·7	16	3	18·8
All ages	5359	1085	20·2	359	71	19·8

Enteric Fever Mortality, 1901. Rate per 1000 living, Compared with Mean of Five Years.

	1896	1897	1898	1899	1900	Mean	1901
England and Wales	0·17	0·16	0·18	0·20	0·16	**0·17**	0·16
London............................	0·13	0·13	0·14	0·18	0·17	**0·15**	0·12
Dublin	0·45	0·58	0·49	0·55	0·38	**0·49**	0·32
City of Manchester	0·22	0·18	0·22	0·13	0·14	**0·18**	0·14
Manchester Township.........	0·28	0·17	0·25	0·15	0·14	**0·20**	0·16
North Manchester	0·18	0·20	0·24	0·11	0·14	**0·17**	0·13
South Manchester	0·20	0·17	0·19	0·14	0·14	**0·17**	0·13

In 1901 there were 359 cases of Enteric Fever notified, which is a decrease of 19 as compared with last year.

The first half of the year was remarkably free from the disease, as only 43 cases were reported in each of the first two quarters. There was a great increase in the third quarter, and in the fourth quarter also the disease was fairly prevalent.

The attack rate of ·66 per 1000 living is the lowest recorded in the past 10 years. In twelve notification towns, the attack rate was nearly double that amount.

The autumnal rise took place sharply in the end of July and beginning of August.

On referring to the table showing the number of attacks in the various districts, it is seen that the incidence of the disease fell most heavily on Clayton, West Gorton, Bradford, Openshaw, Ancoats, and Newton Heath; while Blackley, Chorlton-on-Medlock, Ardwick, and Hulme suffered least.

The proportion of cases removed to Hospital was 61·3 per cent., which is almost the same as last year. In the various districts the proportion varies from 82·7 per cent. in Openshaw to 16·7 per cent. in Moston.

The death-rate per 1000 living was 0·14, which is the same as last year; but is considerably lower than the mean of the last 5 years, viz., 0·18.

As regards the incidence of the disease at the various age-periods, it is of interest to note that out of 39 attacks in children under 10 years of age there were only two deaths, and one of these was in a child under 12 months. This gives a very low case fatality, especially when it is considered that the disease is particularly fatal in the earlier years of life.

The case fatality per cent. among all the notified cases was 19·8, which is considerably higher than the rates for the past 2 years.

THE CONNECTION BETWEEN ENTERIC FEVER AND CONDITIONS OF THE SOIL.

In the Annual Reports for the past three years (1898-1900) the connection between Enteric Fever and Conditions of the Soil has been fully discussed, and it has been shown that the autumnal increase in the number of cases, when these are arranged in weeks according to the dates of onset, and not according to the dates of notification, corresponds generally to a heavy rainfall, described as the critical rainfall, occurring from three to five weeks before. It was further shown that this critical rainfall has almost invariably been preceded and followed by a period of dry or comparatively dry weather, and, moreover, always occurs on an ascending ground temperature.

The number of deaths from Summer Diarrhœa undergoes a similar increase, but at a somewhat earlier period, usually occurring from one to two weeks after the period of critical rainfall.

In the following tables the number of Enteric Fever cases, arranged according to dates of onset, the number of deaths from Diarrhœa, and the various meteorological conditions concerned, are set forth in weeks, a different period being selected for each year, so as to show the autumnal rise in the number of Enteric cases, and the critical rainfall preceding it.

TABLES SHOWING THE NUMBER OF ENTERIC FEVER CASES WHOSE ILLNESS COMMENCED IN THE WEEKS ENDING ON THE FOLLOWING DATES, AND OTHER FACTS.

1899—Weeks ending	June 17	June 24	July 1	July 8	July 15	July 22	July 29	Aug. 5	Aug. 12	Aug. 19	Aug. 26	Sept. 2	Sept. 9
Enteric Cases	4	4	5	2	......	2	5	5	5	15	11	12	10
Deaths from Diarrhœa	8	4	8	5	9	22	42	71	101	107	134	123	126
Mean temperature in shade	61·8	60·6	60·7	61·1	63·7	65·1	61·5	66·9	62·7	62·3	64·3	61·1	61·8
Mean percentage of moisture in the atmosphere	61	73	72	83	77	70	76	71	70	74	68	78	78
Rainfall in inches	......	0·835	2·277	0·293	0·508	0·336	0·010	0·032	0·080	0·551	0·043	1·257	0·281
Underground temperature, 1 foot	59·9	60·8	60·6	60·8	63·8	65·1	64·0	65·6	64·0	63·6	64·4	63·1	61·8
Underground temperature, 4 feet	53·0	54·8	55·9	56·7	57·5	58·7	59·6	60·0	60·8	60·9	60·9	61·0	60·8

1900—Weeks ending	July 21	July 28	Aug. 4	Aug. 11	Aug. 18	Aug. 25	Sept. 1	Sept. 8	Sept. 15	Sept. 22	Sept. 29	Oct. 6	Oct. 13
Enteric Cases	3	6	7	9	9	8	13	10	12	9	17	14	19
Deaths from Diarrhœa	11	19	37	63	50	50	83	78	64	36	58	41	26
Mean temperature in shade	67·5	67·0	60·7	56·5	63·7	60·3	58·1	56·1	57·0	58·9	56·5	51·7	54·5
Mean percentage of moisture in the atmosphere	65	76	75	84	80	78	73	77	89	84	83	81	80
Rainfall in inches	0·140	0·710	2·214	2·963	......	1·044	0·395	0·008	0·025	0·466	0·812	1·868	0·382
Underground temperature, 1 foot	64·9	67·1	64·1	60·2	61·6	62·1	59·8	58·2	57·3	57·1	57·2	53·5	53·8
Underground temperature, 4 feet	57·6	59·1	60·3	60·3	59·5	59·6	59·4	58·8	58·1	57·6	57·3	56·7	55·6

1901—Weeks ending	June 8	June 15	June 22	June 29	July 6	July 13	July 20	July 27	Aug. 3	Aug. 10	Aug. 17	Aug. 24	Aug. 31
Enteric Cases	5	5	3	2	1	2	3	7	13	15	13	12	13
Deaths from Diarrhœa	3	1	3	......	3	12	36	79	122	119	107	110	85
Mean temperature in shade	59·3	53·2	56·4	59·6	62·5	67·4	69·0	63·8	63·4	62·3	59·5	64·0	58·2
Mean percentage of moisture in the atmosphere	65	65	64	69	74	69	59	75	77	79	74	76	73
Rainfall in inches	0·076	0·382	1·110	0·060	0·230	......	0·010	3·790	0·035	0·172	0·449	......	1·104
Underground temperature, 1 foot	58·8	57·0	57·0	59·3	61·6	64·8	67·4	66·2	65·2	63·5	62·9	62·8	61·0
Underground temperature, 4 feet	53·2	54·5	54·8	55·1	56·1	57·3	59·0	60·6	61·1	61·2	61·2	60·9	60·9

Thus, it is seen that for 1901 the autumnal rise took place in the weeks ending July 27th and August 3rd, which is earlier than usual, in fact it is the earliest autumnal rise recorded in the past ten years. The increase is maintained through the month of August, becomes slightly augmented in the beginning of September, and is well sustained until the end of October, when there is a sharp drop in the week ending November 2nd.

There are two periods of rainfall which would favour this rise: that which occurred in the weeks ending June 22nd and 29th amounted to 1·170 inches. This rainfall began on the 19th of June, and continued until June 24th, when it was followed by 5 days on which no rain fell. Preceding this rainfall there were 3 dry days (June 16th–18th).

The second period of rainfall, which would favour the autumnal rise, commenced on June 30th, and continued for two days, when ·230 inches of rain fell.

This was preceded by 5 dry days, and followed by 12 days of drought. Then there was a rainfall of one hour's duration on July 14th, amounting to ·01 of an inch, followed by 6 days on which no rain fell.

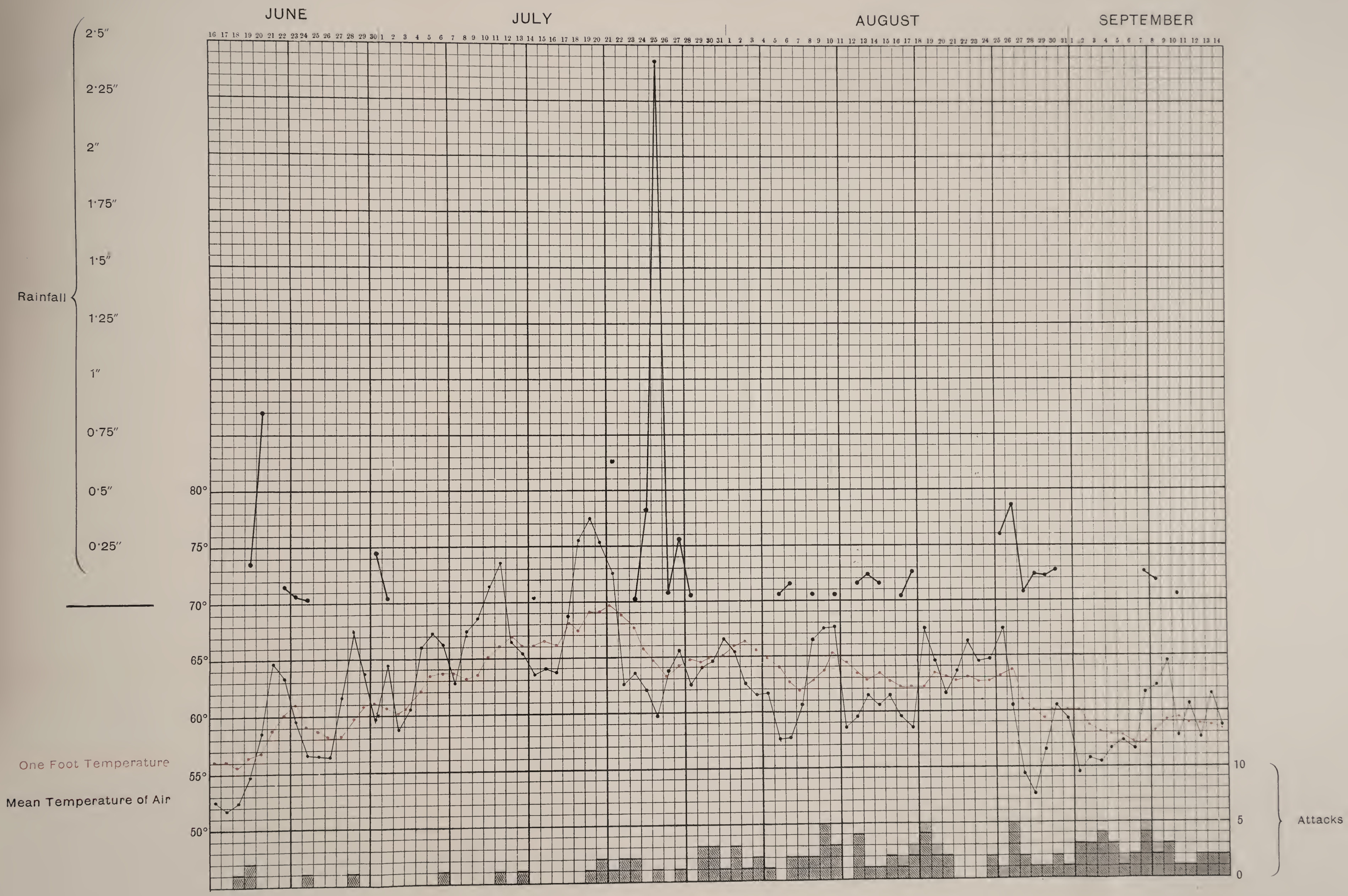
Thus there was a long period of drought, extending from the 2nd to 20th of July, with the exception of the slight shower on July 14th already mentioned.

This period of dry weather was accompanied by a steadily rising ground temperature.

An exceptionally heavy rainfall occurred in the week ending July 27th, but the most of this fell within a few hours on July 25th, when no less than 2·42 inches of rain fell in 12 hours.

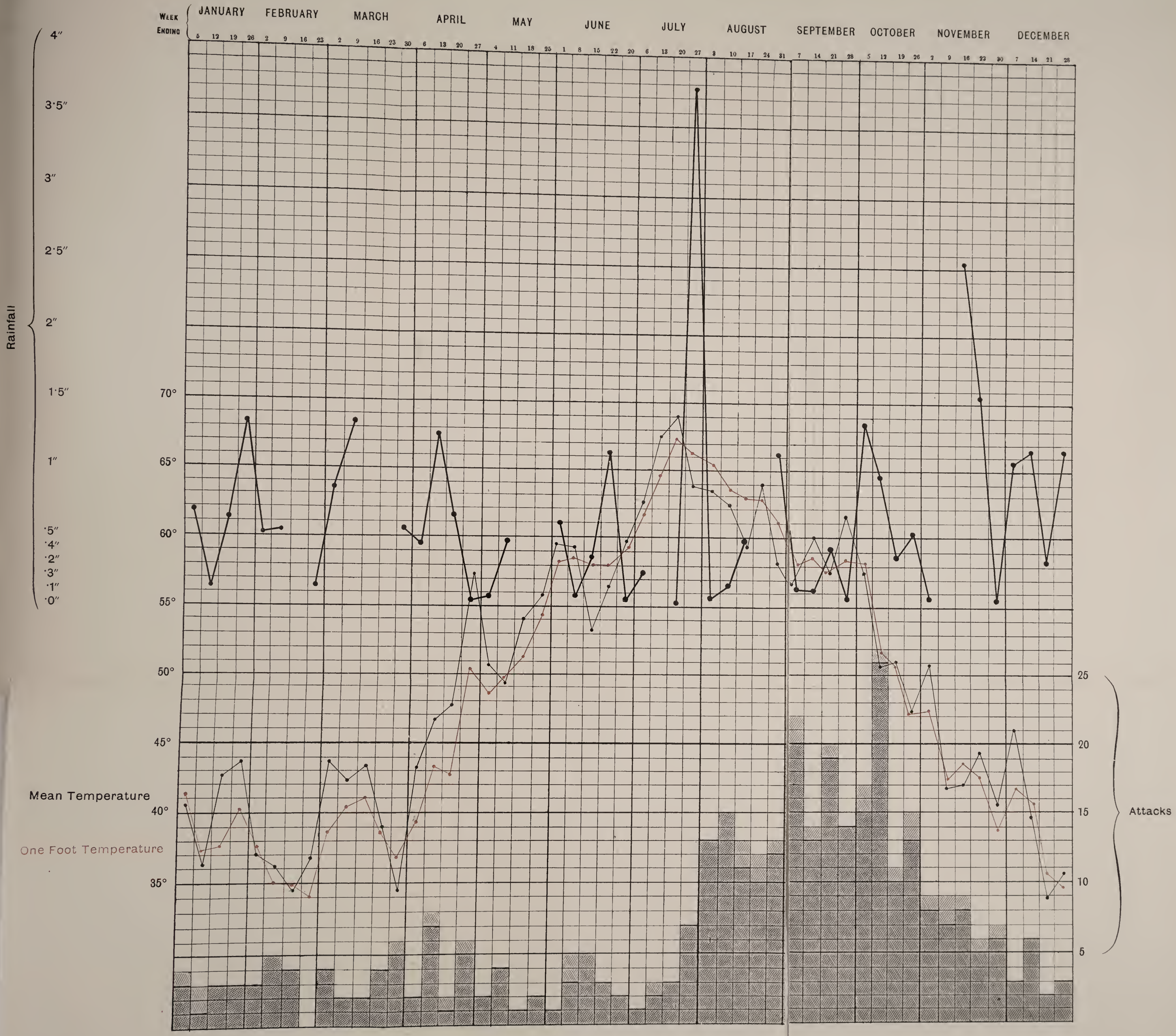
This cannot have influenced the rise, as it occurred within a week of the autumnal rise in the number of Enteric cases, and, further, the increase in the Diarrhœal death-rate had already begun.

1901. DIAGRAM OF CASES OF ENTERIC FEVER ON DATES OF ONSET WITH CURVES OF TEMPERATURE AND RAINFALL.



1901.

ENTERIC FEVER CASES ARRANGED IN WEEKS ACCORDING TO DATES OF ONSET.



Cases traced to Direct Infection... Light Shading.
Other Cases ... ... Dark Shading.

Moreover, in this instance, one of the necessary conditions is absent, viz., a rising ground temperature, for it is seen that after this rainfall the temperature 1 foot underground immediately began to fall.

The increase in the number of deaths from Summer Diarrhœa took place sharply in the week ending July 20th, two weeks before the rise in the number of Enteric cases.

The number of deaths in the previous week was also large, showing that the usual increase had already begun.

There is a further increase shown in the weeks ending July 27th and August 3rd.

The diagram showing the number of attacks of Enteric Fever is accompanied by the curve of the weekly mean temperature, the curve of the temperature 1 foot underground, and by the curve showing the amount of rainfall.

As the cases traced to direct infection could not be influenced by the condition of the soil, all the cases traced to direct personal contact were excluded, and have been added in light shading, but a glance at the diagram shows that no material difference to the shape of the diagram is made, whether these be excluded or not.

A diagram with curves, showing the daily variations in the number of cases and the meteorological conditions is also given.

The history of ascertained infections in Typhoid Fever has been given year by year, as it has been thought desirable to give prominence to the extent to which infection from person to person occurs.

The following is the history for 1901 :—

LIST OF CASES TRACED TO DIRECT INFECTION.

Person infected			Source of Infection	Interval of Illnesses	Remarks
Case	Sex and Age	Bact. Reaction			
2	m. 5	+ Slow and incomplete	....	......	This is an overlooked cas Case 393, 1900, sle with this case during h illness. Onset of prima case about Oct. 1st, ons of second case Nov. 25t Interval, 56 days betwe the dates of onset
4	m. 21	+	Slept with his brother (case 407, 1900), onset December 10th, 1900 (serum test incomplete)	22 days between dates of onset	
7	m. 16	+ incomplete	Brother was removed to Monsall on Dec. 17th suffering from enteric, onset Dec. 7th. Onset in case 7 Jan. 11th. They lived in the same house	From 25 to 35 days	
10	m. 13	—	Other two cases from same house: Case 407, 1900, onset Dec. 10th, 1900; case 4, 1901, onset Jan. 1st, 1901	27 days and 5 days between dates of onset in cases 407 and 4 and this case	Doctor adheres to diagnosis 3 cases in this house: CASE — RENOVED TO MONSALL — ONS 407 (1900) Dec. 29/00 Dec. 4 (nursed at home) Jan 10 Jan. 23, 1901 Jan.
41	f. 25	+	Nursed case 34 from March 10th to March 26th	Longest interval 16 days	At first was suspected to a case of Typhus, but w afterwards diagnosed E teric, and confirmed b blood test
45	m. 5	+	Two cases in same house, father and son. Both ate raw mussels frequently from the same source, the last occasion on which the father partook was March 26th, and the son Mar. 22nd	.....	Onset, March 27
46	m. 28	No specimen		......	Onset, March 25
61	m. 5	+	Case 50 in same house was removed to Monsall on 17th April. This child went into the sick room occasionally and ate any food that was left there up to the 15th April. Onset in this case April 24th	27 days between dates of onset. Shortest interval 9 days	Case of Enteric Fever n door but one 6 or months before. Midd privy

LIST OF CASES TRACED TO DIRECT INFECTION—*continued.*

Person infected			Source of Infection	Interval	Remarks
Case	Sex and Age	Bact. Reaction			
63	m. 11	+	Brother (case 64), onset March 15th, an overlooked case, was nursed by the mother, who prepared food for the rest of the family	31 days between dates of onset	Both cases nursed at home
70	f. 20	+	Nursed her sister (case 34) from March 13th until April 8th	Longest interval 26 days	Same source of infection as case 41
71	m. 25	+	....	......	Case 66. Onset May 1st. Lived next door, and used same midden privy as case 71. Onset May 5th
81	m. 33	+ incomplete	Labourer at Holt Town Manure Works		
85	m. 16	+	Slept with his brother (case 75) at the beginning of his illness, onset May 7th. Onset in this case June 8th. Case 75 removed to Monsall on May 22nd	From 32 days before onset. Shortest interval 17 days	
86	m. 5	+ incomplete	Slept in same room as cases 75 and 85. Onset in this case June 8th	17 to 32 days	3 cases in this house : CASE ONSET 75...................... May 7 85........................June 8 86........................June 8
109	m. 36	+	Sewer man		
131	m. 2	+ Somewhat incomplete	Was often in contact with sister (case 137), an overlooked case. Onset 23rd July. Nursed at home. The blood test in 137 was negatived, but the diagnosis was maintained	From 25 days before onset	
133	m. 19	+ Slow and incomplete	Often in contact with father (case 132). Nursed at home. Onset July 21st. Onset in this case Aug. 16th	From 26 days before onset	
138	f. 32	– Specimen taken early	Lived in same house as cases 131 and 137	26 days between dates of onset in case 137 and this case	Died. Death certified enteric 3 cases in this house : CASE ONSET 137 (overlooked)...July 23 131 ....Aug. 17 138 ....Aug. 18

List of Cases traced to Direct Infection—*continued.*

Person infected			Source of Infection	Interval	Remarks
Case	Sex and Age	Bact. Reaction			
154	f. 19	+	Visited case 103 next door at the beginning of her illness	21 days between dates of onset	
155	m. 34	+	Nightsoil man ; ate food without washing his hands		
162	f. 11	+	Slept with her sister (case 114), who went into Monsall Aug. 15th, onset Aug. 2nd. Onset in this case Aug. 25th. Serum test in case 114 + incomplete	From 10 to 23 days	House overcrowded
168	f. 7	First Specimen — Second Specimen +	Brother (case 119), nursed at home. Patient helped her mother to do housework, but did not go into her brother's bedroom. Onset in first case Aug. 9th, and in this case Sept. 7th.	29 days between dates of onset	
176	f. 13	+	Case 135 next door, onset July 30th. Onset in this case Aug. 31st.	42 days between dates of onset	No direct connection be tween these two case could be traced, but th two pail closets for th two houses stand back to-back, with a commo ash-place between
190	m. 21	No Specimen	Sister (case 142) removed to Monsall on Sept. 12th, onset Aug. 6th. Onset in this case Sept. 8th. Serum test in case 142 was positive	From 33 days before onset	
202	m. 4	Doubtful	In contact with his brother (case 193), onset Aug. 12th. Nursed at home. Onset in this case Sept 18th. Serum test in primary case negative, but the diagnosis was maintained	37 days between dates of onset	Both ate ice-cream in larg quantity
204	f. 31	+	Overlooked case (No. 219) (serum test +), onset 13th July. Removed to Monsall on Sept. 30th. Onset in this case Sept. 5th	54 days between dates of onset	

List of Cases traced to Direct Infection—*continued.*

Person infected			Source of Infection	Interval of Illnesses	Remarks
Case	Sex and Age	Bact. Reaction			
205	f. 16	+	Onset Sept. 2	......	During the latter part of August a brother of these two cases had some obscure illness which confined him to bed for some days. He lived in same house as these two cases, and was nursed by case 205. Serum test not applied
195	m. 25	No Specimen	Onset Sept. 7	......	
224	m. 19	+	Onset Sept. 20	......	A sister of these two cases had "Inflammation of the Brain," and was ill for 5 weeks, onset about the beginning of August. A brother (æt. 7), had pneumonia, which began about the 16th or 18th of August. He was in bed for 4 weeks. Mother had Enteric in same house in November, 1900—10 months before
225	m. 13	+	Onset Sept. 24	......	
233	m. 5	No Specimen	Two previous cases (204 and 219) in this house removed to Monsall on Sept. 21st and 30th respectively. Patient did not sleep with previous cases, but all had food in the same room	25 days between dates of onset in case 204 and this case	3 cases in this house : CASE ONSET 219 (overlooked) ...July 13 204 ....Sept. 5 233 ....Sept. 30
241	m. 15	+	Onset Oct. 1st	......	Two cases in one house, seem to have had a common origin—not traced
242	m. 9	+	Onset Oct. 2nd	......	
254	m. 14	+	Two cases next door : CASE ONSET 193..................Aug. 12 202..................Sept. 18 Onset in this case Oct. 6th. There was no direct communication between the two families	......	Midden closet to each house
259	m. 34	+	Case 108 lived next door and used same midden privy. Onset Aug. 1st, removed to Monsall on Aug. 9th	......	CASE ONSET 259......................Oct. 7 260......................Oct. 10
260	f. 24	+ incomplete			

LIST OF CASES TRACED TO DIRECT INFECTION—*continued.*

Person infected			Source of Infection	Interval	Remarks
Case	Sex and Age	Bact. Reaction			
267	f. 23	+	Case 293 an overlooked case. Serum test +, onset Sept. 4th. Onset in this case Oct. 8th	34 days between dates of onset	
268	f. 26	+	Husband (case 291), an overlooked case (serum test +), onset Aug. 10th. Onset in this case Sept. 30th	51 days between dates of onset	
282	m. 20	+	Patient has been working on a canal boat carrying excreta		
299	f. 56	+	Son (case 292), onset Oct. 9th, was visited by mother on Oct. 21st. No communication between the houses for months before that. Onset in this case Oct. 23rd	2 days	
308	f. 34	+	On Sept. 20th patient cleaned out the room where case 101 was nursed during the latter part of his illness, and on Oct. 14th she began to sleep in same room as case 101 occupied during the first part of his illness. This room had not been disinfected	33 days 9 days or less	CASE ONSET 101 .... July 2 308 .... Oct. 2 Between the dates given patient worked in same house, but went home at night
314	f. 7	+	Sister (case 210) (serum test +) in same house, onset Sept. 16th. Onset in this case Oct. 28th	42 days between dates of onset	Case 210 removed to Withington
319	f. 41	+	Slept with her daughter (case 318) (serum test +), onset Oct. 10th. Nursed at home. Onset in this case Oct. 23	Longest interval, 13 days	
327	f. 15	+	Sister (case 246), nursed at home, notified as Enteric 9th October. Onset July 20(?) (serum test +). Onset in this case Oct. 18th	(?)	

List of Cases traced to Direct Infection—*continued.*

Person infected			Source of Infection	Interva	Remarks
Case	Sex and Age	Bact. Reaction			
336 337 339	f. 12 m. 4 f. 10	+ + +	Sister (case 318) (serum test +) and mother (case 319) nursed at home by case 336 and the district nurse. Children use the sick room as a day room and play about on the floor. House is very dirty	......	5 cases in this house : CASE ONSET 318..................Oct. 10 319..................Oct. 23 336..................Nov 18 337..................Nov. 13 339..................Nov. 4
344	f. 38	(1) — (2) +	Son (case 272) (serum test +) nursed at home, onset Oct. 1st. Onset in this case Nov. 7	37 days between dates of onset	Father, aunt, and brother of case 272 were subsequently notified in 1902, making 5 cases in this house : CASE ONSET 272..................Oct. 1 344..................Nov. 7 Father of case 272...Dec. 14 Aunt do. ... — Brother do. ... —
350	f. 18	—	Was in contact with case 340 (serum test + incomplete) from its onset on Oct. 25th to its removal to Monsall on Nov. 21st. Onset in this case Nov. 28th.	34 days between dates of onset	Serum test was negative, but the case was discharged from Monsall Hospital as Enteric

There are, therefore, only 30 cases where a history of direct personal contact could e obtained, although in several other cases the source of infection was traced with reasonable degree of probability.

There is only one house with five cases, and in this instance the first case was diagnosed, but the patient was nursed at home owing to the parents refusing to allow the child to go to hospital. The house was small for the size of the family, and the people were very dirty in their habits. No attempt at isolation was carried out, as, on a visit being made, the children were found playing about on the floor of the sick room and eating crusts there. The mother who nursed the first case was the second to be notified, and subsequently three of the other children were reported.

In another house there were two cases (son and mother). Here also the mother refused to allow the son to go to hospital; and although the house was clean, and the people reasonably careful in their habits, the mother, who nursed her son, also developed the disease. Subsequently, in 1902, the father, aunt, and brother of the first case were notified as suffering from Enteric Fever, each subsequent case having a history of having been in direct personal contact with one of the previous cases.

There are four houses with three cases each, and one house with two cases, where there had been two cases of suspicious illness, respectively diagnosed "Inflammation of the Brain" and "Pneumonia." In the first of these two suspicious cases the illness commenced about the beginning of August and continued for five weeks; while in the second case the onset took place about the 16th or 18th of August and the illness lasted for four weeks. The two notified cases of Enteric had their onsets on September 20th and 24th respectively. Another point of interest here is that the mother had Enteric Fever in the same house 10 months previously.

Overlooked cases again played an important part in the spread of Enteric Fever by means of direct infection, and to this cause no less than seven of the 30 cases already mentioned were due, each overlooked case being proved by means of Widal's serum test.

The following are also of interest because of the history of previous cases of sickness:—

Case 32.—Landlady had Influenza about the same time.

Case 34.—Two cases of Enteric Fever in the same house 3 years before.

Case 38.—Mother had Enteric Fever, and was in Monsall Hospital in July, 1900. They did not live in the same house then.

Case 134.—Tenant had Influenza about three months before.

Case 165.—Son (æt. 2) had Diarrhœa for one day three weeks before.

Case 192.—Husband had Diarrhœa three weeks previously.

Case 203.—Father (æt. 67) had Diarrhœa, with pain in the bowels, for a few days about seven weeks previously.

Case 248.—Brother (æt. 5) had Pneumonia five months ago, and another brother (æt. 3) died of the same illness about three weeks ago.

Case 361.—There have been three cases notified previously from the same house:—

(1)	Onset	Oct. 2nd, 1892.
(2)	,,	June 18th, 1895.
(3)	,,	June 21st, 1895.
Present case	,,	Nov. 18th, 1901.

ENTERIC FEVER AND SHELLFISH.

In the following cases there was a history of having partaken of shellfish from 7 to 21 days before the onset of illness :—

No. of case	Raw or Cooked	Interval between eating the Shellfish and onset of Illness	If partaken of by other Members of the Family	Remarks
44	Raw	Ate shellfish in January	Husband also	Onset, March 23rd
45 46	Raw mussels	3 days 1 day } Also on many other dates	.. ...	Two cases, father and son, partook of mussels from the same source.
62	Cooked mussels	7 days	No others partook	Patient only ate a few, as the mussels were thought to be bad
89	Raw shellfish	15 days	No others partook	At Cleethorpes
92	Raw oysters	Every day from the 21st to the 14th day before onset	No others partook	At Cleethorpes (See No. 89)
165	Raw oysters	Every day from the 15th to 10th day before onset	No others partook	At Cleethorpes (See Nos. 89 and 92) CASE ONSET 89 ....June 14th 92 ....June 15th 165 ....Aug. 26th
210	Cooked mussels	About 2 weeks	?	Bought from a street hawker
213	Raw oysters and mussels	Eaten frequently	Husband also	......
214	Raw mussels	1 day	......	CASE ONSET 214 ....Sep. 13th
232	Raw mussels	15 days and 8 days	Father and mother also partook on the first date	232 ....Sep. 21st These two patients had raw mussels together on Sept. 13th
243	Raw oysters and other shellfish	Every day from the 13th to 8th day before onset	Wife also	At Southport

Enteric Fever and Shellfish—*continued.*

No. of case	Raw or Cooked	Interval between eating the Shellfish and onset of Illness	If partaken of by other Members of the Family	Remarks
256	Raw oysters	Partaken of daily for months	......	Was in Douglas, Isle of Man, 4 weeks before
272	Raw mussels	About 2 weeks	Companion also partook (case 332)	......
289	Cooked shellfish	19 days	?	......
296	Raw mussels	8 days	No others partook	......
298	Raw and cooked mussels	About a week	No others partook	......
312	Cooked shellfish	About a week	Wife also	......
315	Raw and cooked mussels	Eaten on various dates	?	Got from unknown hawkers
327	Raw oysters	16 and 17 days	All the family partook	Previous case, sister (No. 246), nursed at home
332	Raw mussels	About 3 weeks	Companion also (case 272)	CASE ONSET 272 ....Oct. 8th 332 ....Oct. 10th
353	Cooked mussels	Taken frequently	All the family	......
359	Raw mussels	11 days	Father and brother also	......
364	Raw oysters	Within 21 days	No others partook	......
365	Cooked cockles	14 days	All the family partook	......
370	(?) mussels	6 or 7 days	Wife also partook	Wife also felt ill after eating the mussels

There are 25 cases with a history more or less definite of having eaten shellfish within a period of from one to three weeks before the onset of illness.

In six of the cases it was stated that the shellfish were cooked before eating, but in some of these cases it is not certain that none were eaten raw.

In five of the cases where the shellfish were eaten raw, others also partook without any history of their having suffered in health, and in one of these cases the source of infection was traced to a sister (case 246) who had been nursed by the patient, and who had been ill for about nine weeks before the consumption of the shellfish.

In one case (No. 370) the wife also partook, and was also ill for a few days after eating them, but was not notified as having suffered from Enteric Fever. The serum test was applied twice to the husband, and on both occasions gave a negative result, but the doctor adhered to his diagnosis.

In cases 89, 22, and 165 the shellfish were partaken of at Cleethorpes, and in the first two of these cases at the same period, the onset of illness having occurred within a day of each other.

In other two cases (Nos. 45 and 46) shellfish were partaken of from the same source three days and one day before onset respectively, and also on many other dates. Both developed Enteric Fever, the dates of onset being March 25th and 27th.

Cases 214 and 232 had raw mussels together on September 13th, and both developed Enteric Fever. The incubation period in the first case is too short. No history of their having partaken of shellfish together on a previous date could be ascertained. Case 232 also had shellfish 15 days before onset, but on that occasion his father and mother also partook, and were not ill in any way.

In other two cases (Nos. 272 and 332) there was a history of having eaten raw mussels together about the 18th of September.

It is often difficult to state with precision the exact date of the onset of illness in a case of Enteric Fever, and in case 272 the illness was at first put down as having begun about October 1st, but on careful inquiry being made it was found that it would be more correct to place the date of onset on October 8th. Thus the two cases began about three weeks after the consumption of the shellfish.

ICE-CREAM.

In the following cases, in which no other source of infection could be traced, there is a history of having eaten ice-cream. The interval in many cases was not stated with exactness, and no doubt it is often impossible to do so, as many people eat large quantities of ice-cream. In no case was the infection traced to this source with any degree of certainty :—

No. of Case	Interval between time of eating and the beginning of illness	Remarks
56	2 days.	
67	5 days.	Ice-cream was bought on that day from four different dealers.
68	12 days from last date of eating, also every week-end.	Rest of family also partook.
83	8 days.	Brother also partook.
94	Frequently at week-ends.	
142	Frequently.	Ice-cream shop. No previous cases of illness.
148	14 days and 7 days.	
149	Every Sunday.	
169	9 days.	
192	3 days.	Others also partook.
193	24 to 4 days.	Ice-cream eaten in large quantities from 24 to 4 days before onset.
194	11 days.	Eaten at Lytham.
212	Partaken of at week-ends.	Child also partook.
230	At least 13 days before onset.	
265	1 month.	
318	About 14 days.	
325	7 days (also on several previous Sundays.)	
326	Frequently.	
343	Ice-cream eaten.	
352	Ice-cream eaten.	
360	Frequently, last time 5 days before onset.	

ENTERIC FEVER AND MILK SUPPLY.

During the year the milk supply in all cases of Enteric Fever was ascertained, the wholesale as well as the retail dealer's name being given. It was thus possible to trace the infection to any wholesale dealer who might have had an infected supply, and who, by supplying a number of small shops, might otherwise have escaped detection.

One large company, with numerous shops throughout the City, had the largest number of cases, viz., 20; but as the particular shop was not always given, as in many cases the milk was got from carts, and, moreover, as the cases of Enteric Fever supplied with milk from this dairy are fairly evenly distributed throughout the year, it does not appear that there was any source of infection in this case.

But, in another instance, 19 cases derived their milk, either directly or indirectly, from one particular shop, and although a large number of customers are supplied there are good grounds for suspicion that there was some source of infection in this instance.

The following are the cases with their dates of onset :—

No. of Case	Date of Onset
2	About October 1st, 1900
31	February 16th, 1901
83	June 6th
251	August 5th
124	August 10th
151	August 12th
193	August 12th
149	August 20th
184	August 26th
198	September 7th
203	September 9th, 1901
192	September 10th
274	September 17th
202	September 18th
237	September 28th
254	October 6th
266	October 11th
340	October 25th
354	December 1st

It will be observed that the first three of these cases appear at long intervals and may be excluded; but in the month of August there are six cases, and also six in September and three in October, occurring at short intervals. Thus, there are more cases than could be accounted for by the usual autumnal increase.

Further, a youth who sold milk from a handcart from this dairy developed Enteric Fever. This boy stated that he drank large quantities of milk at the dairy, and also that the milk used at his home was got from the same dairy. In this case, however, there were two previous cases of Typhoid next door, but there had been no communication between the families.

Case 202 had been in direct personal contact with his brother (case 193), and so this was an instance rather of direct infection than of milk infection.

An investigation into this matter was conducted by Dr. Cowie under the direction of the Medical Officer of Health.

At that time there had been 12 cases of Enteric Fever with this milk supply from the beginning of August to the 14th October, the last notified case being the milkboy mentioned above, but in two of these cases (Nos. 124 and 149) the milk was supplied indirectly through a smaller retail dealer.

This boy's home was visited in the first instance, when it was found that he had been removed to hospital. His mother was interviewed, and stated that although the boy had not been in his usual health for about a month, he did not develop any serious symptoms until October 6th, when he complained of severe headache and loss of appetite, followed on the next day by sickness and pains in the limbs.

No history of this boy having been in contact with the cases next door could be elicited, but his brother (æt. 5) had been ill for a few days prior to the date of visit. A specimen of blood from this latter case was examined for Widal's Reaction, but was found to be negative.

The boy himself was then visited at Monsall Hospital on the 19th October. He was very ill, but was able to answer a few questions. None of the ten cases that derived their milk directly from this dairy had been supplied by him, and as each boy was stated to wash his own milk cans, and in no way handled those of any other lad, it became apparent that this boy could not have been the source of infection, even although his illness had dated back to some period prior to October 6th.

The addresses of the 10 Enteric patients were read over to him, and he was able to state that 9 patients out of the 10 were, he thought, in the round supplied by another lad named D—— J——. Two of these 9 patients were, however, in one house.

No other information could be got from him except that, as far as he knew, there had been no cases of Enteric Fever or other illness among his companions.

The dairy in question was visited on the 21st October, and was found to be clean and in good condition, with the exception of a bad midden-closet in the yard which adjoins the place where the milk cans are washed.

There was no history of any illness having occurred among the employés for months with the exception that D—— J——(the boy already referred to) had been ill for three days about a month before with severe headache and loss of appetite. This boy was then interviewed. He admitted having had headache and loss of appetite a month before, but stated that he had never been off work. He also admitted serving the 9 customers with milk as already mentioned. Although he appeared in good health, a specimen of his blood was taken, but was found to be negative to Widal's test.

A list of all the farms supplying milk to this dairy was obtained on the same day, and a letter of inquiry as to whether there had been any cases of illness in the family or among the employés, and if any its nature, was sent to all the farmers by the Medical Officer of Health.

Some of the farmers did not reply, but in all those where an answer was received no case of illness of importance was reported.

On October 23rd another specimen of blood was taken from D—— J—— and was again negative. His home was also visited, but there had been no case of illness there, or among the neighbours or the boy's companions. It now seemed certain that D—— J—— was not the source of infection. On the same day a list of the farms, the milk from which was sold by D—— J—— and the dates of such use from the 28th July to October 7th was obtained. On perusing the list closely it was found that the milk from two farms had been used by this boy with fair regularity, although the milk from the same farms was also used occasionally by the other boys.

As no reply to the letter of inquiry had been received from those two farmers, Dr. Cowie visited the farms on November 21st. At the first farm visited it was stated that no case of any illness of any kind had occurred during the summer in the family, consisting of the farmer, two sons, and a housekeeper, or among the employés, consisting of one man and his wife, who had no family living with them. The water used for cooling the milk and for washing the cans is pumped from the River Lathkil, which flows just below the farm. At the second farm the same history was got. There had been no case of illness in the family (the farmer, wife, and two daughters), and the two boys who assisted the farmer and lived at the farm had also been in perfect health. The water supply is derived from a surface well behind the house. The water appeared fairly good, and no direct source of pollution was ascertained.

As after this, cases of Enteric Fever with this milk supply ceased being notified, and as time did not permit of the remaining farms being visited, the matter was allowed to rest, although no source of infection was discovered.

It may be noted here that some of the cases in question may possibly have been infected at school. (See Report on Schools.)

Two other dairies supplied 7 cases each, but the dates of onset do not point to those milk supplies being in any way infected.

ENTERIC FEVER AND SCHOOLS.

In the following schools it is possible that the disease was contracted while at school. Suspicion attaches especially to No. 3.

1.—School in West Gorton.

Case	Date of Onset	Age	Sex	Department	History of Infection
61	April 24th	5	M	Infant	Infected from case 50 outside the school
237	September 28th	6	M	Infant	See milk supply
266	October 11th	11	M	—	None
340	October 25th	7	F	Infant	See milk supply

2.—School in Openshaw.

Case	Date of Onset	Age	Sex	Department	History of Infection
108	August 1st	6	M	Infant	None
122	August 6th	4	M	Infant	
149	August 20th	7	M	Infant	See milk supply
274	September 17th	13	M	—	See milk supply

3.—School in Hulme.

Case	Date of Onset	Age	Sex	Department	History of Infection
271	October 11th	10	F	Girls	None
280	September 29th	11	F	Girls	None
289	September 20th	11	F	Girls	None

In the West Gorton and Openshaw schools, the three cases in each of the infant departments used the same closets, which are automatically-flushed latrines.

In the school in Hulme all the patients were in the same class and used the same closets, the drains from which had been blocked, and had just been opened at the time of the inspector's visit. The closet in the yard occupied by the infants were also partly stopped up. On this side also there was a set of latrines which were flushed by hand by means of a plug. These had previouslv been condemned, and had only been reopened since November, 1900. This closet was defective, and had a large quantity of excreta standing in it. Although in the infants' yard, it had been used by the girls as well.

All this cannot disprove the origin of occasional outbreaks of Enteric Fever from defective contaminated closets, but it does seem to show that this method of propagation requires special favourable conditions.

It is also of interest to note that four of the cases from these schools had the same milk supply, viz., the supply suspected of being infected. (See Report on Milk Supply.) One of these cases (No. 340) was notified after the investigation had begun, and one of them (No. 149) derived the milk supply through a small retail dealer. The other two cases received their milk direct from the dairy in question.

The following cases were infected outside Manchester :—

Case	Where Infected	Remarks
28	Stockton-on-Tees	Patient came from Stockton-on-Tees five days before onset
69	Millwall	......
102	?	Traveller
126	Moss Side	......
145	Salford	......
223	Belfast	......
230	?	Traveller
307	?	Traveller

There were four cases of Enteric Fever notified from each of the two following works, which are both in Openshaw :—

A

Case	Date of onset	Occupation	Serum test	History of Infection
37	Mar. 2	Painter	+	None
125	Aug. 9	Fitter	—diagnosis maintained	None
250	Sept. 17	Labourer	+	None
320	Oct. 15	Moulder	+ incomplete	None

B

Case	Date of onset	Occupation	Serum test	History of Infection
110	July 30	Coach Trimmer	+ incomplete	None
118	Aug. 4	Marker Off	No test applied	None
235	Sept. 8	Blacksmith	— (diagnosis confirmed	None
258	Oct. 7	Machinest	+	Previous case lived next door, and used same midden privy

The closets at both these works are water-closets, and were reported as being in good condition and clean. Table B refers to the same works as was commented on in the Annual Report for 1899, when five cases were reported.

The figures showing the relation of pails, middens, and water-closets to Enteric Fever are as follows :—

PAIL-CLOSETS WITH A URINE GUIDE.

Adjoining the house			Within 4 feet of the house			4 feet or more distant		
Floor dry	Floor wet	Otherwise defective	Floor dry	Floor wet	Defective	Floor dry	Floor wet	Defective
69	2	9	12	0	1	78	5	6
80			13			89		

Total, 182.

Pail-closets without a Urine Guide.

Adjoining the house			Within 4 feet of the house			4 feet or more distant		
Floor dry	Floor wet	Otherwise defective	Floor dry	Floor wet	Defective	Floor dry	Floor wet	Defective
7	2	0	0	0	0	2	3	0
9			0			5		

Total, 14.

Midden Closets.

Adjoining the house			Within 4 feet of the house			4 feet or more distant		
Floor dry	Floor wet	Defective	Floor dry	Floor wet	Defective	Floor dry	Floor wet	Defective
11	0	4	17	0	3	32	1	7
15			20			40		

Total, 75.

Water-closets = 97.

Three of these had defective joints, one was cracked below the seal, and one had been blocked for two weeks. Total number of pail-closets = 196, of which 14 were without urine guides and 23 otherwise defective, giving a total of 37 pail-closets presenting conditions more than usually favourable to the propagation of the disease.

Total number of middens = 75, of which 15 were in a defective condition.

Other insanitary conditions found in houses in which Enteric Fever occurred are summarised below :—

	Source of infection traced	Not traced	Total
Overcrowding	1	5	6
Defective drainage.....................	14	55	69
Dirty condition of house	3	11	14
General insanitary conditions	10	74	84

BACTERIOLOGICAL EXAMINATIONS.

The following is a tabulated statement of the result of the bacteriological examinatio at the College of specimens of blood taken from suspected cases :—

BACTERIOLOGICAL EXAMINATIONS.

Number of cases submitted to examination	Cases examined outside Hospital			Cases examined inside Hospinal			Other specimens taken in the Hospital				Number of others examined
							For administrative purposes		Cases from outside districts		
	Positive re-action	Negative adheres	Negative accepts	Positive re-action	Negative adheres	Negative accepts	Positive	Negative	Positive	Negative	
718	245	31	331	41	7	23	7	9	1	1	22

BACTERIOLOGY OF ENTERIC FEVER.

A further investigation by Dr. Sidney Martin into the behaviour of the typhoid bacillus in soils, published in the Medical Officer's Annual Supplement for 1899-1900, goes to show that the typhoid bacillus grows freely in some sterilised soils, especially in rich garden mould, but fails to grow in some other soils.

He finds that in unsterilised soil it has to contend with other micro-organisms for existence, and at comparatively high temperatures unsuccessfully, so far as his investigations go. At a temperature of 2–12° C., however, in moderately dry soils, it survives for a time, but cannot be recovered after 12 days. Assuming that the annual sudden onset of infectivity, which our tables appear to show, is not dependent on growth in the soil, it is somewhat difficult to account for it. The prolonged drought which seems, in our tables, to precede the infective period may, however, suffice to produce that degree of sterilisation of the soil which is necessary to favour the growth of the bacillus. At all events, so far, the bacteriological results have not come into an allied relation with the etiological data.

JAMES COWIE.

MEASLES.

The following tables show the death-rates from Measles during the year 1901. The death-rate in Manchester is not high as compared with 1896, 1897, and 1899, but it is higher than in 1900.

The extent to which different districts were affected is also shown.

When we look at the table showing the death-rates in the four quarters of the year, we perceive that the disease exacted a very excessive mortality in the fourth quarter.

It will be seen that our present procedures are not very successful. I have in former years advised the closing of infant departments as soon as the incidence of Measles has reached 10 per cent. of the average attendance.

To close them earlier would be to run the risk of the disease breaking out again when the school re-opens. To close them much later is useless. The removal of 10 per cent. suffering from Measles is found to be sufficient, generally, to prevent the disease from spreading when the school re-opens.

I have previously given reasons for believing that the above procedure checks the extension of the disease in the neighbourhood of the school. More cannot be claimed. The course of an outbreak may be spread out and extended in this manner; it cannot be arrested by the means which have, so far, been adopted.

The extent to which the infant departments of schools were affected in 1901 is shown in the following list (see page 169).

The following are the rates of mortality for 1901, compared with the mean of the previous five years:—

1901.—Measles Mortality.—Rate per 1000 living, compared with mean of five years.

	1896	1897	1898	1899	1900	Mean	1901
England and Wales	0·56	0·40	0·41	0·31	0·39	**0·41**	0·27
33 Great Towns	0·71	0·55	0·56	0·46	0·43	**0·54**	0·43
London	0·82	0·43	0·69	0·47	0·42	**0·57**	0·43
City of Manchester	1·05	1·17	0·50	1·28	0·47	**0·89**	0·53
Manchester Township	1·89	1·69	0·48	2·35	0·37	**1·36**	0·58
North Manchester	1·01	0·63	0·56	1·22	0·53	**0·79**	0·29
South Manchester	0·57	1·18	0·48	0·71	0·48	**0·68**	0·68
67 Smaller Towns	0·64	0·43	0·41	0·28	0·51	**0·45**	0·25
Rural Districts	0·43	0·29	0·31	0·21	0·32	**0·31**	0·17

The deaths from Measles in districts are as follows :—

1901—DEATHS AND DEATH-RATES FROM MEASLES IN THE VARIOUS DIVISIONS OF THE CITY.

	Statistical Divisions	Estimated Population	Deaths	Death-rate
	City of Manchester	**546,408**	**292**	**0·53**
I.	Manchester Township ...	135,006	78	0·58
II.	North Manchester.........	167,257	49	0·29
III.	South Manchester.........	244,145	165	0·68
I.	Ancoats	45,014	33	0·73
	Central	30,047	12	0·40
	St. George's	59,945	33	0·55
II.	Cheetham	37,207	6	0·16
	Crumpsall	8,852	1	0·11
	Blackley......................	8,878	6	0·68
	Harpurhey	15,893	4	0·25
	Moston	12,161	4	0·33
	Newton Heath	40,525	14	0·35
	Bradford	23,766	10	0·42
	Beswick	11,686	2	0·17
	Clayton	8,289	2	0·24
III.	Ardwick	41,454	25	0·60
	Openshaw	27,358	12	0·44
	Gorton (West)	29,459	22	0·75
	Rusholme and Kirk.......	20,544	7	0·34
	Chorlton-upon-Medlock..	57,956	41	0·71
	Hulme	67,374	58	0·86

1901.—MEASLES.—DEATHS IN QUARTERS IN THE CITY AND IN GROUPS OF DISTRICTS.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
City of Manchester	20	59	53	160
Manchester Township ...	7	32	14	25
North Manchester	4	11	12	22
South Manchester	9	16	27	113

WHOOPING COUGH.

The tables relating to this disease show the death-rate in Manchester for 1901 and for the preceding five years; in 1901 it exceeded the death-rate for England and Wales by 0·11 per 1,000 living.

The rates giving the Whooping Cough mortality for 1901 are as follows:—

1901.—Whooping Cough Mortality.—Rate per 1000 living, compared with mean of five years.

	1896	1897	1898	1899	1900	Mean	1901
England and Wales	0·41	0·35	0·31	0·30	0·34	**0·34**	0·30
33 Great Towns	0·57	0·41	0·42	0·38	0·45	**0·45**	0·36
London	0·65	0·41	0·48	0·38	0·43	**0·47**	0·35
City of Manchester...	0·66	0·56	0·31	0·42	0·68	**0·53**	0·41
Manchester Township ...	0·92	0·68	0·41	0·41	0·79	**0·64**	0·41
North Manchester	0·50	0·29	0·14	0·50	0·66	**0·42**	0·48
South Manchester.........	0·60	0·64	0·36	0·37	0·64	**0·52**	0·36
67 Smaller Towns.........	0·43	0·38	0·27	0·32	0·34	**0·35**	0·30
Rural Districts	0·30	0·31	0·25	0·25	0·27	**0·28**	0·25

Whooping Cough was less fatal than usual in 1901.

The following are the deaths in quarters, which shows that the disease was most prevalent in the first half of the year:—

1901.—Whooping Cough.—Deaths in Quarters in the City, and in Groups and Districts.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
City of Manchester	70	75	41	38
Manchester Township ...	11	15	17	13
North Manchester	26	28	8	19
South Manchester	33	32	16	6

The following table shows the districts most affected :—

1901.—DEATHS AND DEATH-RATES FROM WHOOPING COUGH IN THE VARIOUS DIVISIONS OF THE CITY.

	Statistical Divisions	Estimated Population	Deaths	Death-rates
	City of Manchester	**546,408**	**224**	**0·41**
I.	Manchester Township	135,006	56	0·41
II.	North Manchester	167,257	81	0·48
III.	South Manchester	244,145	87	0·36
I.	Ancoats	45,014	24	0·53
	Central	30,047	10	0·33
	St. George's	59,945	22	0·37
II.	Cheetham	37,207	8	0·22
	Crumpsall	8,852	...	...
	Blackley	8,878	2	0·23
	Harpurhey	15,893	9	0·57
	Moston	12,161	6	0·49
	Newton Heath	40,525	21	0·52
	Bradford	23,766	19	0·80
	Beswick	11,686	12	1·03
	Clayton	8,289	4	0·48
III.	Ardwick	41,454	14	0·34
	Openshaw	27,358	10	0·37
	Gorton (West)	29,459	12	0·41
	Rusholme and Kirk.	20,544	8	0·39
	Chorlton-upon-Medlock	57,956	18	0·31
	Hulme	67,374	25	0·37

The following schools or portions of schools were closed during the year 1901 :—

Date	School	Department	By Whom Closed
Sept. 19th...	St. Stephen's, Church of England...	Infant	School Authorities
Sept. 27th...	Ross Place Board	„	„
Oct. 8th...	Christ Church Board, Chorlton-upon-Medlock	„	„
Oct. 23rd...	Ardwick Board	„	„
Nov. 5th...	Mulberry Street Board	„	„
Oct. 28th...	Holy Family, Roman Catholic	„	Medical Officer of Health
Nov. 8th...	Cathedral, Church of England	Whole	School Authorities
Nov. 15th...	St. Mary's, Church of England, Hulme	Infant	Medical Officer of Health
Dec. 3rd...	Bangor Street Board	„	School Authorities
Dec. 3rd...	Cavandish Street Board	„	„
Dec. 3rd...	St. Michael's Board	„	„
Dec. 9th...	St. Peter's, Church of England, Blackley	„	„

Board Schools	7
Church of England Schools	4
Roman Catholic	1
	12

The following table shows the schools having an excessive incidence of Measles and Whooping Cough, mostly on the Infant Department, at some period of the year 1901 :—

NUMBER AND PERCENTAGE (10 AND OVER) OF SCHOLARS ABSENT FROM THE DEPARTMENTS OF SCHOOLS SUFFERING FROM MEASLES AND WHOOPING COUGH DURING 1901.

Date	School	Department	Average Attendance	Present Attendance	Measles	Whooping Cough	Percentage
March 11	Ardwick Board	Infant	133	141	...	19	14
October 23	,,	,,	135	109	70	...	52
November 18	,,	,,	129	120	46	...	36
December 16	,,	,,	135	158	15	...	11
,, 11	Ashton Old Road Board	,,	218	191	36	...	17
November 18	Bangor Street Board	,,	253	208	33	...	13
December 3	,,	,,	228	165	63	...	23
June 19	Burgess Street Board	,,	487	485	68	...	14
July 1	,,	,,	484	454	52	...	11
,, 20	Cavendish Street Board	,,	198	98	28	...	14
November 13	,,	,,	183	137	47	...	26
,, 26	,,	,,	179	143	49	...	27
March 4	Chester Street Board	,,	213	198	29	...	14
July 1	Clarendon Road Board	,,	142	141	28	...	20
,, 15	,,	,,	80	69	40	...	50
June 4	Dean Lane Board	Mixed	425	422	43	...	10
November 7	Duke Street Board	Infant	253	240	29	...	11
July 15	Embden Street Board	,,	75	75	21	...	28
April 29	Every Street Board	,,	263	253	...	28	11
May 13	,,	,,	262	253	...	32	12
January 25	Grimshaw Lane	,,	104	98	...	16	15
February 9	,,	,,	102	82	29	...	28
May 9	Grosvenor Street	,,	101	94	14	...	14
June 4	Lancasterian	,,	79	71	13	...	16
,, 19	,,	,,	68	59	12	...	18
November 18	Lloyd Street	,,	389	310	49	...	13
December 3	,,	,,	385	349	40	...	10
October 23	Mulberry Street	,,	200	194	24	...	12
November 7	,,	,,	186	156	61	...	33
December 11	,,	,,	173	168	36	...	21

NUMBER AND PERCENTAGE (10 AND OVER) OF SCHOLARS ABSENT, ETC.—*continued.*

Date	School	Department	Average Attendance	Present Attendance	Measles	Whooping Cough	Percentage
September 14	Ross Place	Infant	171	166	30	...	18
,, 27	,,	,,	163	126	71	...	44
October 29	,,	,,	159	162	22	...	14
July 9	St. Barnabas	,,	180	114	32	...	18
,, 20	,,	,,	178	90	50	...	28
May 13	St. George's	,,	177	163	33	...	19
June 4	,,	,,	176	137	54	...	31
May 13	St. Peter's Board	,,	83	56	20	...	24
June 4	,,	,,	74	56	23	...	31
June 19	Smedley Road	,,	133	129	41	...	31
July 1	,,	,,	134	160	25	...	19
November 7	,,	,,	125	116	...	17	14
,, 26	,,	,,	120	93	...	30	25
December 11	,,	,,	118	100	36	...	31
November 13	Thomas Street	,,	341	279	63	...	18
,, 26	,,	,,	325	246	55	...	17
June 4	Tuer Street	Whole	158	141	18	...	11
,, 19	,,	,,	155	130	17	...	11
December 17	Varna Street	Infant	340	290	39	...	10
July 1	Vine Street	,,	222	244	28	...	12
,, 15	,,	,,	223	147	48	...	22
April 26	Webster Street	,,	323	192	78	...	24
July 1	Waterloo Street	,,	365	325	49	...	13
,, 15	,,	,,	323	192	78	...	24
	CHURCH OF ENGLAND SCHOOLS.						
May 10	Albert Memorial	Infant	188	188	19	...	10
,, 24	,,	,,	178	189	35	...	19
November 23	All Saints, Chorlton-upon-Medlock	,,	117	87	25	...	21
December 6	All Saints, Gorton	,,	243	168	63	...	26
May 9	,, Newton	,,	85	74	18	...	21
February 5	Cathedral	Whole	190	128	50	...	26

NUMBER AND PERCENTAGE (10 AND OVER) SCHOLARS ABSENT, ETC.—*continued.*

Date		School	Department	Average Attendance	Present Attendance	Measles	Whooping Cough	Percentage
July	2	Holy Trinity, Rusholme	Infant	146	119	27	...	18
,,	10	,, ,,	,,	156	86	59	...	38
December	9	,, Harpurhey	,,	220	155	60	...	27
,,	9	,, ,,	,,	220	155	...	24	11
April	26	Memorial	Whole	423	362	...	51	12
January	17	St. Andrew's, Homer Street	Infant	147	144	27	...	18
,,	18	St. Ann's, Newton	,,	170	158	30	...	18
June	12	,, ,,	,,	158	146	20	...	13
,,	25	,, ,,	,,	158	139	18	...	11
July	11	,, ,,	,,	158	126	28	...	11
December	11	St. Catherine's	,,	112	70	40	...	36
,,	6	St. Chrysostom's	,,	134	95	40	...	35
June	13	St. Clement's, West Gorton	,,	197	192	...	25	13
October	2	,, ,,	,,	196	182	44	...	22
,,	29	,, ,,	,,	182	176	21	...	12
May	10	St. Cross	,,	130	102	...	27	21
April	5	St. James', Rusholme	,,	80	59	17	...	21
July	9	,, ,,	,,	92	72	15	...	16
November	26	St. John the Baptist	,,	136	118	24	...	18
June	13	St. John's, Longsight	,,	297	237	30	...	10
January	31	St. Jude's	,,	116	94	14	...	12
,,	31	,,	,,	116	94	...	12	10
February	14	,,	,,	115	86	20	...	18
,,	14	,,	,,	115	86	...	12	10
March	29	St. Luke's, Chorlton-upon-Medlock	,,	60	49	13	...	22
,,	29	,, ,,	,,	60	49	...	8	13
July	19	St. Luke's, Moston	,,	41	46	11	...	26
March	14	St. Mark's, Gorton	,,	236	208	36	...	15
November	29	St. Mark's, Gorton	,,	158	130	25	...	16
March	20	,, Newton	,,	205	177	38	...	19
April	16	,, ,,	,,	205	133	70	...	31
November	2	St. Mary's, Hulme	,,	235	175	36	...	15
December	20	,, ,,	,,	209	103	22	...	11

Number and Percentage (10 and over) of Scholars Absent, etc.—*continued.*

Date	School	Department	Average Attendance	Present Attendance	Measles	Whooping Cough	Percentage
June 27	St. Mary's, Moston	Infant	44	21	34	...	77
November 28	St. Peter's	,,	87	70	16	...	18
September 23	St. Phillip's, Hulme	,,	279	249	34	...	12
October 1	,, ,,	,,	278	213	58	...	21
,, 12	,, ,,	,,	278	213	64	...	23
,, 25	,, ,,	,,	279	244	41	...	15
November 2	,, ,,	,,	279	239	28	...	10
March 1	,, Ancoats	,,	240	210	38	...	16
,, 8	,, ,,	,,	240	241	31	...	13
June 12	St. Silas'	,,	129	106	13	...	10
September 23	St. Stephen's, C.-on-M.	Girls	213	...	28	...	13
,, 23	,, ,,	Infant	178	...	90	...	51
,, 28	St. Thomas', Red Bank	,,	74	51	30	...	41
October 11	,, ,,	,,	89	47	37	...	42
	Roman Catholic.						
July 11	Corpus Christi	Infant	245	173	43	...	18
October 28	Holy Family	,,	127	127	34	...	27
July 15	Holy Name	,,	150	120	42	..	28
October 22	Mount Carmel	,,	165	125	40	...	24
May 25	St. Bridget's	,,	210	198	40	...	19
January 15	St. Edward's	,,	138	96	34	...	25
December 16	St. Francis'	,,	300	230	34	...	11
May 10	St. Patrick's	Jr. B.	308	280	35	...	11
	Wesleyan.						
July 6	Eagle Street	Infant	75	67	18	...	24
December 5	,,	,,	120	73	35	...	29
November 15	Longsight	,,	310	297	41	...	13
December 16	Openshaw	,,	222	132	14	...	29

SUMMER DIARRHŒA.

The facts relating to fatal Summer Diarrhœa are shown in the following tables for 1901.

The death-rate from Summer Diarrhœa is again excessive in this year

On consulting the table showing the deaths in successive years, we see that there have been a series of very fatal years, viz:—1897, 1898, 1899, 1900, and 1901.

The same phenomenon is noticeable for the country generally, so that the conditions favouring this excessive fatality from Summer Diarrhœa have been general. But the death-rate has been, in Manchester, double that of the country generally, and has been considerably in excess of that for the 33 great towns.

A perusal of the table showing these facts also shows that possibly only a lowered birth-rate saved the year 1901 from being the most severe of all.

Corresponding to the long drought in 1901 and to the very warm summer, the deaths are concentrated to a remarkable extent in the third quarter.

In actual total severity, this year yields to 1898 and 1899. The years chiefly affected all show a low rainfall in the third quarter. But the mere fact of a comparatively low total rainfall is not in itself sufficient to produce a high Diarrhœal mortality.

The effect of drought and of a high temperature in producing a high mortality is very clearly seen on the daily curve of deaths and meteorological conditions when we note the death-rate August 1st to August 4th, and again the descent beginning August 5th. This is further illustrated by the succeeding ascents and descents in the deaths, as shown by the following chart. (The curves and diagram were prepared by Dr. Cowie.)

It is difficult to interpret such a picture otherwise than as showing the results of changes in the superficial layers of the soil.

Nevertheless, the food is a necessary intermediate agent, and there seems to be no doubt that the fatal result is dependent—

1. On previous bad nutrition of the infant.
2. On insufficient precautions to protect the food from infection.

To avert this excessive mortality, then, different lines of work are required:—

1. To keep the ground and houses clean.
2. To keep the milk clean and fresh.

3. To instruct parents or their adolescent daughters in the means necessary to prevent the food from becoming infected.

4. To get a clean and fresh milk supply.

These are very difficult objects to attain, but the high mortality amongst young infants is a constant spur to effort.

As usual, the death-rate from Diarrhœa is greatest in the least sanitary parts of the City.

On the 3rd July, 1901, the four-foot thermometer stood at 56°·0, the critical point at which Dr. Ballard has shown that Summer Diarrhœa assumes a prevalent character. The thermometer continued to rise until, on the 11th of August, it stood at 61°·4. From that date a fall set in, and on September 30th it stood at 58°·0.

The following are the registered deaths from Diarrhœa and Simple Cholera in weeks during the third quarter of the year :—

July 6th	3
„ 13th	12
„ 20th	36
„ 27th	79
Aug. 3rd	122
„ 10th	119
„ 17th	107
„ 24th	110
„ 31st	85
Sept. 7th	68
„ 14th	63
„ 21st	35
„ 28th	26
	865

The numbers of deaths in quarters are as follows :—

DIARRHŒA AND SIMPLE CHOLERA DEATHS IN QUARTERS 1891–1901.

	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901
First Quarter	45	32	48	47	51	37	49	55	46	41	45
Second Quarter	64	36	131	55	59	78	50	49	53	66	32
Third Quarter	217	275	688	212	574	391	803	807	948	562	865
Fourth Quarter	106	75	89	61	220	66	62	179	74	153	74
	432	418	956	375	904	572	964	1090	1121	822	1016

By means of the following table we are enabled to observe the comparative degree of severity with which different districts of the City have been visited. It should be compared with the corresponding tables in recent reports.

1901.—DEATHS AND DEATH-RATES FROM DIARRHŒA AND SIMPLE CHOLERA IN THE VARIOUS DIVISIONS OF THE CITY.

	STATISTICAL DIVISIONS	Estimated Population	Deaths	Death-rates	Deaths under 1 year per 1000 Births
	City of Manchester	**546,408**	**1016**	**1·86**	**47·54**
I.	Manchester Township	135,006	367	2·72	61·64
II.	Northern Districts	167,257	269	1·61	42·31
III.	Southern Districts	244,145	380	1·56	43·22
I.	Ancoats	45,014	138	3·07	57·38
	Central	30,047	70	2·33	66·10
	St. George's	59,945	159	2·65	63·27
II.	Cheetham	37,207	36	0·97	27·26
	Crumpsall	8,852	10	1·13	23·15
	Blackley	8,878	4	0·45	9·17
	Harpurhey	15,893	21	1·32	36·51
	Moston	12,161	10	0·82	19·02
	Newton Heath	40,525	69	1·70	49·67
	Bradford	23,766	65	2·74	62·65
	Beswick	11,686	27	2·31	50·00
	Clayton	8,289	27	3·26	94·86
III.	Ardwick	41,454	79	1·91	48·44
	Openshaw	27,358	48	1·75	48·07
	West Gorton	29,459	64	2·17	58·35
	Rusholme and Kirk	20,544	28	1·36	33·12
	Chorlton-upon-Medlock	57,956	47	0·81	27·91
	Hulme	67,374	114	1·69	43 75

By means of the following rates we are enabled to compare the fatality from Diarrhœa and Simple Cholera in Manchester with that prevailing in other parts of the country :—

1901.—DIARRHŒA AND SIMPLE CHOLERA MORTALITY.—RATE PER 1,000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1896	1897	1898	1899	1900	Mean	1901
England and Wales	0·55	0·86	0·96	0·98	0·69	**0·81**	0·91
33 Great Towns	0·79	1·24	1·22	1·21	0·94	**1·08**	1·23
London	0·72	0·92	0·97	0·93	0·78	**0·86**	0·87
City of Manchester	1·06	1·79	2·01	2·05	1·52	**1·69**	1·86
Manchester Township	1·44	2·35	2·66	2·60	2·12	**2·23**	2·72
North Manchester	0·80	1·50	1·66	2·00	1·10	**1·41**	1·61
South Manchester	0·98	1·65	1·85	1·78	1·45	**1·54**	1·56
67 Smaller Towns	0·68	1·05	1·09	1·22	0·81	**0·97**	1·09
Rural Districts	0·36	0·56	0·75	0·76	0·48	**0·58**	0·65

The following table supplies meteorological data for the third quarter of the year, the season in which the disease is most prevalent :—

Third Quarter of the years	Mean Temperature	Rainfall, Inches	Humidity, per cent.	Diarrhœa and Simple Cholera Mortality. Annual Rate per 1,000 living
1887	59°·0	7·7	73 %	3·38
1888	56°·5	11·2	77 %	1·36
1889	57°·7	10·5	73 %	2·61
1890	58°·8	8·1	74 %	2·28
1891	58°·2	12·8	79 %	1·57
1892	57°·0	12·5	78 %	2·07
1893	60°·4	10·7	74 %	4·95
1894	57°·8	9·0	78 %	1·55
1895	60°·4	11·2	77 %	4·17
1896	58°·5	9·7	76 %	2·93
1897	58°·9	9·7	73 %	6·01
1898	60°·1	6·1	74 %	6·00
1899	60°·8	7·7	75 %	6·96
1900	60°·3	9 6	78 %	4·14
Mean	**58°·9**	**9·8**	**76 %**	**3·57**
1901	61°·9	6·5	74 %	6·33

VOLUNTARY NOTIFICATION OF PHTHISIS.

The work done in connection with Phthisis continues with unabated vigour. There is no department of Public Health work in which the value of administrative action is so apparent as in this. The researches of Dr. Cornet have conclusively shown that in houses inhabited by Consumptives of careless personal habits there is an accumulation of dust which is highly infectious to guinea pigs, and which must, when disturbed, be infectious to other members of the household. These researches on which our action had been largely based were confirmed in an admirable manner by a research carried out, under the direction of Professor Delépine, by Dr. Harold Coates while attached to the Public Health Office of Manchester. Dr. Coates confirmed also Professor Delépine's pronouncement as to the value of chlorinated lime, and showed that, with the conditions under which we had applied it, cleansing by dough was adequate to remove all infection. The graduated methods of disinfection and cleansing, at which I had arrived from a knowledge of contemporary researches, and from the practical requirements of administration, were thus shown to be in entire agreement with strict scientific requirements. The application of chlorinated lime we owe to Professor Delépine, and the application of dough to a research by Esmarch in Koch's laboratory.

The work of Dr. Cornet, Dr. Coates, and other observers, shows the great danger of spitting in workshops, railway carriages, waiting-rooms, tramcars, theatres, music halls, clubs, public-houses, &c.

The destructive effects of careless personal habits are most clearly demonstrated in connection with public-houses and common lodging-houses.

The mortality from Phthisis of the servants employed in public-houses, and of the inmates of common lodging-houses, is very excessive, in both cases due, no doubt, to the habit of spitting on the floors. It seems evident, therefore, that intemperate men and women are specially liable to Phthisis, not only because they are often exposed in public-houses to infection, but because they suffer from drinker's catarrh. Such was the conclusion to which I was formerly led by direct inquiry into deaths from Consumption, and Dr. Mackenzie, of St. Thomas's Hospital who investigated the subject specially arrived at the same conclusion independently. It is possible that this may be obscured in a given group of Consumptives, partly owing to the fact that a history of intemperance is not so easily obtained during the life of the Consumptive, or directly after death, and partly from the disappearance of submerged phthisical drinkers, who are only known as persons who have entered the workhouse or whose history cannot be traced.

The investigations tabulated by the medical assistants on forms which were drawn up as the result of previous investigations show that, corresponding to the scientific facts, there is abundant evidence of exposure to an adequate amount of infection in the case of a large proportion of the consumptives, both at home and in the workshop; so abundant, indeed, as to stamp contamination with expectoration as the most dangerous form of dirt which a house or workshop can undergo. These histories have been again very fully set out, as it is believed that such a record is still needed to show the great value of the work which we are carrying on, as well as the urgent need for hospital provision.

The objects aimed at in the administration established by the Corporation have been briefly these :—

1. To instruct Consumptives and their families, personally and by hand-bills, in the precautions required to prevent the further accumulation of infection.

2. To remove or destroy the infection already accumulated, and for that purpose to determine in each case the precise kind and amount of disinfection required.

3. To prevent, as far as possible, the future recurrence of carelessness in households afflicted with Phthisis.

4. To collect evidence of the communication of Phthisis when those necessary precautions are neglected; to gauge the effect of different classes of occupation, and so to show what further action is required; and generally to determine under what conditions the disease is communicated. It is necessary to collect and sift such materials, so that we may not waste our efforts, but concentrate on the points of real danger.

5. To ascertain the effect of insanitary conditions, such as overcrowding, and as far as possible to remedy them.

6. To sift all the facts ascertained. To ascertain when the cases reported are or are not clearly Phthisis, and where further inquiry is necessary in order to establish the nature of the disease.

7. To make any investigation required to establish points of importance.

Thus Dr. Beatty (senior medical assistant) has, at my request, utilised the materials accumulated in the office (adding to these a further personal investigation of the facts) in order to determine whether, in fact, the administrative measures pursued do avert the subsequent occurrence of phthisical cases in a house infected with Tuberculosis. He has arrived at the conclusion that such is the case. His investigation not only supports the measures taken here, but adds weight to the inferences drawn as to the modes of infection in particular cases. It is in entire accord with the experimental results obtained by Esmarch and Delépine, and subsequently by Dr. Coates.

It will be seen that the objects of notification as given above require not only that the investigators should be medical men, but that they should be medical men of the greatest judgment and tact, and possessed of the qualities necessary for sifting complicated facts.

The form of inquiry used in the administration of Tuberculosis is an elaborate one, and covers a great many points; necessarily so, since the ramifications of the disease are often obscure, and the causes of infection complicated. It embraces the physique of the patient, the houses which he has inhabited, the occupations which he has followed, his personal habits, disabling conditions which he may have undergone, all with time, place, and circumstance, the date of commencement of his illness, his exposure to infection with date and place, the facts about his family, the sanitary conditions under which he is living, the precautions which he is adopting, the instructions which he receives at the visit, and the disinfection required—no less would be of use to illustrate how the disease is spread, and how it may be averted.

It had previously been shown that the experimental facts of infection are supported by a wealth of evidence of previous exposure to infection of phthisical persons, and that healthy persons do not contract consumption except upon intense exposure. But it was felt that only proof upon proof would bring this home to the public.

There is indeed ample proof, but it needs careful searching and sifting. Not only is the accumulation of such evidence valuable for education, but it is essential in fulfilling our duties in relation to houses and workshops, and it is only by the patient accumulation of facts that we shall see our way clear as to the employments which most urgently need attention.

Elaborate as is the form of enquiry drawn up, it cannot be said that any of the details are unnecessary for the elucidation of practical questions, while most of them are immediately available for administrative action.

It is necessary to emphasise this point, as it is sometimes supposed that work is done which has no bearing on practical procedure, and it is impossible to be constantly repeating the details of administrative procedure. These were fully given by Alderman McDougall in his paper to the Congress of Tuberculosis in 1901, a copy of which was sent by him to every member of the City Council.

It appears appropriate here to observe that this Congress, held under the patronage of His Majesty King Edward the VII., has had a remarkable influence in quickening the action of sanitary authorities in dealing with Consumption.

I would lay great stress on the accumulation of the facts of personal infection, which require a highly-trained medical intellect both for extraction and rejection. Then again, the very important work of personal instruction can only be adequately carried out by a highly-trained medical man of good standing and judgment. The discriminations necessary for suitable measures of disinfection are also best made by him. Such a man alone can skilfully extract facts relating to personal habits or pre-disposing conditions.

In many other ways the administration is in my opinion dependent for its efficiency on the medical assistants, whose valuable additions to the knowledge of the disease and to the success of preventive action are generally recognised.

The administration, however, does not rest entirely with the medical men. It depends, in no small degree, on the manner in which the materials accumulated are arranged and indexed, and this has been effected in a very excellent manner by Mr. Lock. It is proper that I should acknowledge here the valuable assistance which I received from Mr. T. L. Ellwood (chief clerk in the Public Health Office) in the initial elaboration of the administrative arrangements. Further, much depends on the subsequent action of the Sanitary Inspectors and Health Visitors. They are expected to visit the houses of Consumptives once a month, and every three months to see that the rooms occupied by Consumptives are carefully cleansed. At their monthly visit they should see that the houses are clean, and ascertain that proper personal instructions are carried out. This duty has been generally carried out exceedingly well by the Health Visitors, and to a varying extent by the Sanitary Inspectors. This is a most important part of the work which requires a profound conviction of its importance, and much tact and good feeling.

It may be fairly said that a considerable degree of success has attended our efforts. It is true that only about one-third of all the cases are known to us and dealt with. But they are cases occurring in such homes as render them peculiarly dangerous, and our operations are, therefore, doing a maximum of good. Moreover, they must profoundly affect the precautions taken by those in better circumstances.

It remains to mention new directions in which our work requires to be pursued :

1st. The experiments which the Hospitals Sub-Committee have carried out at Clayton Hospital has proved that provision for advanced cases of

Phthisis from crowded homes is an urgent need, which is keenly felt by the families of Consumptives. I estimate that a provision of 100 beds would meet the most urgent cases. The splendid gift of Mr. W. J. Crossley, J.P., of a new Sanatorium for Consumptives will do much to prevent Phthisis, but in no way relieves the need to provide for advanced cases of Consumption.

2nd. The new Factory and Workshop Act renders it necessary that special attention should now be given to the condition of workshops in connection with the habit of spitting.

3rd. The Sanitary Authority is now placing spit bottles at the disposal of Consumptives, and these, if in work, should be required to use them. This applies also to Consumptives in houses in which work is taken in.

4th. Additional attention is required to public-houses and other places where spitting is practised. Ample powers exist to deal with this form of dirt. It is a piece of great good fortune for Manchester, in its effort as a Sanitary Authority to remove the causes leading to the spread of Consumption, that the Chairman of the Sanitary Committee (Alderman Walton Smith) and the Deputy Chairman (Alderman McDougall), as well as the Chairman of the Nuisances Sub-Committee (Mr. Councillor Fildes), who has bestowed so much attention on the Hospital for Consumption at Bowdon, should all have thrown themselves with ardour into the question of the practical measures required.

The following very full and careful analysis of the records of cases of Consumption visited in 1901, compiled by Dr. James Beatty, will amply show the great value of the work which has been carried on, and adds to the materials which we have already accumulated in such a manner as to enforce the need for strenuous preventive action, and to indicate the direction which it should assume.

REPORT ON THE VOLUNTARY NOTIFICATION OF PHTHISIS.

Public Health Office,
Town Hall, Manchester,
February, 1902.

To the Medical Officer of Health.

I have to submit the report on the work done and the results obtained in the Tuberculosis Department during the year 1901 in connection with the Voluntary Notification of Phthisis.

During the year 1,339 fresh cases of Phthisis were notified to the Medical Officer of Health.

Of these notifications, 625 were notified from the Union Hospitals or by the Poor-Law Union District Medical Officers; 373 cases were notified from the various hospitals and dispensaries in the city not connected with the poor-law administration; and 341 cases were notified by private medical practitioners.

The following table shows the Hospitals from which the Institution cases were notified :—

Manchester Union Workhouse	414
Chorlton Union Workhouse	140
Prestwich Union Workhouse	9
Poor-Law Union cases	62
Consumption Hospital	190
Ancoats Hospital...	79
Chorlton-upon-Medlock Dispensary	8
Hulme Dispensary	21
Gartside Street Dispensary...	19
Royal Infirmary	19
Medical Mission, Red Bank	26
Clinical Hospital	3
St. Mary's Hospital	1
Southern Hospital	1
Children's Hospital, Pendlebury	5
Homœpathic Institution	1
	998

There were 1,012 patients removed and nursed in Hospitals, as follows :—

Manchester Union Workhouse	628
Chorlton Union Workhouse	261
Prestwich Union Workhouse	14
Ancoats Hospital...	21
Mr. Crossley's "Home of Peace," Openshaw	14
Bowdon Hospital for Consumptives	32
Southport Convalescent Home	8
Children's Hospital, Pendlebury	7
Clayton Hospital...	23
St. Annes Children's Home	3
Clinical Hospital...	1
	1,012

The following table shows the distribution in districts of the cases notified during the year:—

		Cases Notified	Deaths Registered
	City of Manchester	**1339**	**1142**
I.	Manchester Township	667	469
II.	North Manchester	230	204
III.	South Manchester	442	469
I.	Ancoats	227	127
	Central	156	132
	St. George's	284	210
II.	Cheetham	67	37
	Crumpsall	12	9
	Blackley	14	19
	Harpurhey	22	16
	Moston	11	13
	Newton	49	60
	Bradford	28	28
	Beswick	19	16
	Clayton	8	6
III.	Ardwick	50	64
	Openshaw	35	34
	West Gorton	40	42
	Rusholme and Kirkmanshulme	28	33
	Chorlton-upon-Medlock	131	138
	Hulme	158	158

The total number of deaths from Phthisis in Manchester during the year was 1,142; of these deaths, 638 were of cases which had been previously notified to the Medical Officer of Health, and 504 were of cases which had not been notified.

Extensive use has been made during the year of the facilities offered by the Corporation for the bacteriological examination of specimens of sputum where such an examination would be of assistance in coming to an early conclusion as to the diagnosis in doubtful cases. In this way 517 specimens of sputum have been examined. Tubercle bacilli were found in 232 of these, and were not discovered in 285 specimens.

Cleansing and Disinfection.

The number of houses disinfected by the Corporation with chlorinated lime solution was 792. Among these there were 144 houses where the walls were not stripped of their paper, but the paper was rubbed down with dough, while the floors and ceilings were washed with chlorinated lime.

In some cases, where the Consumptive patient was nursed at home, chlorinated lime solution could not be used on account of the irritating effect of the chlorine on the respiratory organs of the patient. In these cases a milk of lime was used, the walls being stripped of their paper. These cases numbered 15.

In many cases the bedding and personal clothing of the patient have been disinfected by steam. In other cases these have been well washed in boiling water. Esmarch's method of disinfection of wall-papers with dough, mentioned above, has been carried out on 1,776 occasions during the year. In houses cleansed by Esmarch's method the floors and painted surfaces have been washed with soap and water, and the bedding and personal clothing of the patient have been well washed in boiling water.

In a few cases the tenants have refused to carry out any measures of disinfection ; in a few other cases disinfection has been rendered unnecessary by the apparent recovery of the patient.

The common lodging-houses are limewashed throughout twice a year, in accordance with the requirements of the Public Health Act of 1875.

The supervision of these common lodging-houses is carried out by the police, and an inspector and one constable are set apart exclusively for this duty. If any houses are found in a dirty condition the owners are prosecuted.

The Medical Officer of Health, by the instruction of the Sanitary Committee, has provided placards to be placed in every room of all the common lodging-houses in the city, pointing out the danger of spitting on the floor. For having these put up the Sanitary Committee are indebted to the kind offices of the Watch Committee.

Although there has been a great improvement in many common lodging-houses in this respect, in others little or no change seems to have taken place. In the smaller common lodging-houses so impressed are the keepers with the infectiousness of Phthisis, or so much annoyed are they with the constant recurrence of disinfection, that many declare their determination to admit no one into their houses who suffers from a cough.

Where evidence of infection of floors or walls by spitting is found, that common lodging-house is disinfected by the Corporation with chlorinated lime.

Home Isolation and Precautions.

In most cases it was found that no attempt had been made to isolate the patient at home, and as many of the patients are in total ignorance of the precautions necessary as to the disposal of sputum, etc., it is evident, in most of the houses occupied by Consumptives, that infective material is scattered broadcast.

In some cases, however, isolation is fairly good. One hundred and seventy patients were found to be using a separate bedroom, and these patients were for the most part carrying out the necessary precautions as to the disposal of their expectorations.

In order to see that these conditions are maintained, and in those houses where no precautions have been taken to see that the instructions given are followed, a Sanitary Inspector or a Female Health Visitor makes a monthly inspection, observing particularly whether the house is kept clean and free from dust. During the year 338 such cases have been referred to the Sanitary Inspectors, and 323 to the Female Health Visitors; and at the close of the year the Inspectors had 267 cases under supervision, and the Female Health Visitors 346. The difference in the numbers of those referred to and those under supervision is due to the fact that many have been removed to hospital, have died, or have removed, and that others are still under supervision who had been notified in 1900.

A short account of the routine followed by the Female Health Visitors and the Sanitary Inspectors in carrying out this work may be of interest:—

Monthly Inspection.—The Female Health Visitor after her visit fills up a form to the effect that the house is being kept clean, and that the necessary personal precautions are being taken. This form is sent to the Public Health Office. Should she find that she cannot certify to this effect, she reports to the office that the proper precautions are not being taken, and in this case the Sanitary Inspector is sent to the house to ascertain what measures for cleansing are requisite; in most cases it is found necessary for the Corporation to clean these houses. In the cases where the Sanitary Inspector makes the monthly visit, lists are made out in the office fortnightly of the cases requiring visitation, and a list of his cases (if any) is given to each Inspector containing a column for his remarks on the state of the house, death, removal, etc., and on this statement action is taken to obtain cleanliness if necessary.

Quarterly Cleaning.—It is an essential part of the system that in all houses under inspection, even those apparently clean, the occupant should undertake a thorough cleansing of the house every three months. After seeing that this is done, the Female Health Visitor fills up a special form, giving a report as to the amount and quality of the cleansing done. If she cannot get this properly carried out, the Sanitary Inspector is sent to the house as mentioned above. In rare cases, where there has been some delay in sending in this report, the form on which it is made is filled up for the particular house of which information is required, and this is sent to the Female Health Visitor. On the other hand, these forms are always filled up for particular houses where the Sanitary Inspectors are concerned, as the multifarious character of their duties renders it difficult for them to remember the dates when the quarterly cleansings become due.

Deaths of Cases not Previously Notified.—The Sanitary Inspector is sent to the house and fills up a form as to the amount of cleansing and disinfection required, and later reports on other forms whether this has been carried out. All forms filled as described above are filed, so that a continuous record is kept of the state of any house and the precautions taken by any patient under observation. Besides, the date of each visit made is entered in a special book kept for the purpose.

This is the scheme in use from the first, though various improvements in administrative details have been found necessary since 1899 as the result of experience.

In practice it is found that the scheme works satisfactorily, and that at present there is little failure in supervision. From time to time it is true patients definitely refuse to carry out the precautions required or resent the visits made to them, but these cases are very rare in proportion to the whole number of cases under observation. The occurrence of such cases depends on two factors. First, the visitor—it is found that the visits of the Female Health Visitors are not resented; second, the patient—objections are rarely met with in the central districts, where the people are very poor, while the better-class patients do occasionally consider the visit an insult to their intelligence or to their cleanliness.

A recent addition has been made to the instructions given to patients in the carrying out of personal precautions. The use of a spit bottle has always been recommended to each patient to be used when at work; but as it seemed clear that the patients did not act on this recommendation, the Corporation, at the suggestion of the Medical Officer of Health, decided to supply these spit bottles gratis to suitable cases. The following notice has been sent to the Health Visitors and the Sanitary Inspectors:—

"The Corporation is prepared to supply spit bottles gratis for the use of Consumptive patients whose houses you are visiting periodically, and who are wishful to take proper precautions against the spread of the disease. Kindly see the patients upon the matter, and apply to me for bottles for those who, in your opinion, will make good use of them."

These directions are given along with the spit bottle :—

"*Directions for the use of the Pocket Spittoons.*

"1. Carry the spittoon in a waistcoat or other suitable pocket, with the larger end up.

"2. To use the spittoon, unscrew the larger metal top, and, in spitting, see that nothing adheres to the sides.

"3. The contents must be disinfected daily; for this purpose a small saucepan must be employed, which should not be put to any other use.

"4. To disinfect the spittoon, pour cold water into the saucepan sufficient to cover the spit bottle, unscrew the caps, and place the spit bottle with its contents, as well as the caps, in the saucepan.

"Raise the saucepan to the boil slowly, and keep it boiling for a quarter-of-an-hour, then put it aside to cool.

"5. The spit bottle may then be rinsed out into the saucepan with cold water, or cold water and soda, and the caps also washed over and screwed on, when the bottle will be ready for use. The contents of the saucepan may then be poured into the sewer.

"6. Please note, that unless heating is carried out carefully as above, the bottle will break.

"7. Expectorated matter may be disinfected in other ways, as by allowing a 20 per cent. solution of carbolic acid to stand for some hours in contact with the expectorations in the bottle, but the plan given above is both cheapest and best.

"8. The spit bottle is to be used by the Consumptive when at home, instead of a pocket-handkerchief, as well as when away from home.

"Soft clean paper, or a clean rag, may be used at home, but must be immediately burned.

"The paper used in wiping the lips must also be burned at the earliest possible opportunity.

"MEDICAL OFFICER OF HEALTH."

Investigation of Cases.

The number of investigation sheets filled during the year was 1,505. As a rule, the Assistant Medical Officer who investigates the case gives instructions as to the character of the disinfection which is to be carried out; but at one time, when there was a great accumulation of work, some of the cases notified from the poorer localities were handed over to the Sanitary Inspector to be at once dealt with, so that no delay should occur before disinfection was carried out. In cases where information that a case has lived in a house is derived from the death reports, this is the usual procedure.

The total number of cases visited by the Assistant Medical Officers during the year was 1,455. Of the 50 cases unvisited, some had been left over from the previous year. These had not been included with those of the previous year, because wrong addresses had been given, or the patients had removed from the address given, and it was hoped that later notifications would supply the address needed.

Two of the Assistant Medical Officers (Dr. Coates and Dr. McCleary) resigned during the year, having obtained appointments as Medical Officers of Health elsewhere; and two were appointed to fill their posts, Dr. Beatty and Dr. Cowie. The numbers of cases investigated by each are as follows:—

Dr. Coates	305
Dr. McCleary	162
Dr. Beatty	705
Dr. Cowie	283
	1,455

As mentioned above, 50 cases were not visited.

In many cases it was necessary to pay three or four visits before the patient, or any person capable of giving information respecting the patient, could be found in the house. This was especially the case in the summer months.

On visiting many of the houses from which a case was notified it was found that the patient had gone into the workhouse, and that there was no one left who could give any information about the patient; in other cases the houses were found empty, the patient and his relatives having removed between the date of the notification and the date of investigation. These cases in which no information was obtained numbered 392.

In 41 cases it was found that the patient had given a wrong address to the Medical Attendant notifying the case. This fact was notified to the Medical Attendant, and he was asked to supply the correct address; this he was very often unable to do, as the patient had seen him only once at a Dispensary or had since left the Institution in which the Doctor had seen him. In 16 cases the existence of Phthisis in the case was doubtful.

Deducting these 449 cases from the 1,455 visited, there remain 1,006 cases in which there was some information available.

A source of infection was detected in 652 out of these 1,006 cases, *i.e.*, in 64·8 per cent. Of these 652 sources, 467 may be described as probable sources, *i.e.*, 46·4 per cent. of the 1,006; and 185, or 18·4 per cent., were more doubtful sources, but still with some degree of probability attached to them.

Among these 1,006 cases, 123 were cases where neither the patient nor a close relative nor an intimate friend was seen, and the information obtained was altogether inadequate to explain the occurrence of the disease; these being deducted leave a total of 883 in which a cause might be found. A source was found in 73·8 per cent. of these, 52·8 per cent. having a probable source and 21 per cent. a more doubtful source.

There remain 281 cases in which no source of infection could be detected. In many of these cases the patient himself was seen, so that all the information required was obtainable; but in others the patient was not seen, and the relative or intimate friend interviewed could not give the requisite particulars as to the patient's workplace or workmates, and thus an important possible source of infection was left without investigation.

Note.—When a case is quoted under the head "sources of infection" the name of the investigator is indicated: in the case of Dr. Coates or Dr. McCleary by the name in full in brackets after the case, in the case of Dr. Beatty or Dr. Cowie by the initial "B" or "C."

Sources of Infection.

The most common source of infection is a consumptive relative. The cases where this was the presumed source numbered 303. As a rule, the patient lived in the same house as the relative mentioned, but examples are given where patient and relative lived in different houses. In most cases the probabilities are decidedly in favour of this being the source of infection, but in others this cannot be said; these sources are therefore classified into "probable" and "doubtful":—

	Probable	Doubtful
Grandfather	2	1
Grandmother	...	1
Father	29	17
Mother	25	11
Brother	46	15
Sister	39	13
Husband	17	9
Wife	22	2
Son	5	2
Daughter	10	2
Uncle	3	1
Aunt	4	1
Niece	2	1
Nephew	...	...
Father-in-law	...	...
Mother-in-law	...	...
Brother-in-law	6	2
Sister-in-law	3	2
Son-in-law	...	1
Daughter-in-law	1	...
Cousin	6	2
Total	220	83
Relative of relative	1	...

Other sources of infection, of which examples are given in the following pages, may be classified as follows :—

	Probable	Doubtful
Companion (not a relative)	65	19
Relative of Companion	...	1
Fiancé or ée	2	1
Employer	6	...
Landlord or one of his family	5	...
Lodger	11	...
Neighbour	16	7
Other cases in the same street	...	3
Infection from House	7	5
Infection from School	...	1
Infection from Church, Mission Hall, &c. ...	...	2
Infection from Place of Amusement	1	1
Public Houses	14	6
Infected Milk	1	3
Infected Books	...	1
Infected Clothes	1	1
Infected Furniture	...	1
Workfellow	45	20
Work	61	21
Tubercular disease elsewhere than in the lungs of an associate	11	8
Total	246	102

Patients probably infected by living in the same house as a Consumptive who was not a Relative.

Case 392. F. 43.—Ill 6 months. (Investigated April 16th, 1901.) Patient spent a good deal of time sitting with a consumptive patient (case 291/99) in this house, who died November 13th, 1899. (Coates.)

Case 400. F. 22.—Ill 18 months. A lodger, aged 26, lived in this house for two years, and left it eighteen months ago. He suffered from a chronic cough and spit. Patient's mother washed the lodger's soiled clothes, and though the patient did not assist at the wash, she collected these clothes for her mother. (B.)

Case 497. M. 44.—Ill 2 years. About three years ago two men came to lodge with patient, one of whom had phthisis; this latter man stayed six months. About six months after he left patient began to be ill. (Coates.)

Case 559. M. 31.—Ill 4 years. About six years ago patient lived for twelve months in a house where a man died of phthisis during his stay; shortly after he left the housekeeper died of phthisis. He believes, too, that another man who lived in this house about the same time is suffering from consumption at present. (B.)

Case 986. M. 61.—Ill six months, slight cough for many years. A lodger who lived with the family for about a year left them three to four years ago and went to Southport, where she died of phthisis about four months after. (B.)

Case 1151. F. 3.—Ill 3 months at least. Up to six months ago patient used to sleep with a man who died of phthisis about a fortnight before the date of investigation of this case. (B.)

Case 1214. F. 40.—Ill 3 years. A companion died of phthisis 5 years ago. Patient nursed her, and slept with her till near her death. (B.)

Case 57. M. 36.—Ill 1 year. (Investigated February 13th, 1901.) A young woman lodged in this house for 3 years, ending August, 1900. She had consumption all the time. (McCleary.)

Case 64. M. 47.—Ill 1 year. Lodger who had lived with patient for 9 years died here of consumption 8 weeks ago. He had been ill for about 3 years. (McCleary.)

Case 1234. F. 27.—Ill 2½ years. About 4 years ago a young woman who was ill of consumption came to lodge with patient. She lived about 10 weeks with her, and then went into the Union Hospital, where she died about six weeks after. (C.)

Case 1290. M. 38.—Ill 1 year. A man lodged with patient for 9 months, leaving about 3 years ago. He had a very bad cough and spit then, and has since died of consumption. (C.)

In the next case another source of infection is present, which may have been the true source :—

Case 1488. M. 40.—Ill 6 months. A lodger who was on intimate terms with the family died of phthisis 3 years ago; during his illness he sometimes spat on the floor. (B.) This patient is a warehouseman, and, as will be seen later, those employed in this occupation seem to be particularly exposed to infection in the course of their work.

Patients who had been Intimately Associated with Consumptive Relatives though not actually living in the same house.

Case 226. F. 30.—Ill 8 months. Brother died of phthisis 17 months ago. Patient did not live in the same house, but often saw him. (McCleary.)

Case 463. M. 43.—Ill 2 years. Brother died of phthisis in Salford one year ago. Patient did not live with him, but spent a good deal of time with him. (Coates.)

Case 506. M. 48.—Ill 2 years. Sister died of phthisis 5 to 6 years ago. Patient did not live in the same house, but visited her frequently. (Coates.) The length of time between the death of this sister and the stated commencement of symptoms would apparently exclude the possibility of this sister being the source of infection, but it must be remembered that in most cases the duration of the illness is underestimated by the patient, and still more so by his friends.

Case 552. F. 5.—Ill 6 months. Two aunts have phthisis at present, living in different houses. Patient is constantly visiting one or other aunt. (Coates.)

Case 590. F. 40.—Ill 4 months. Aunt died one year ago. She suffered from cough and emaciation. Patient was intimate with her. (B.)

Case 614. M. 44.—Ill 5 months or more. Sister, age 50, has had phthisis for the last 14 months, lives in the same district. Patient is not very intimate with her, does not often go to see her. The infection in this case is more probably due to a neighbour with whom patient has been intimate, and who at the date of the investigation had been ill 12 months or more. (B.)

Case 705. F. 33.—Ill 4 years. A brother-in-law living next door has suffered from phthisis for the last 8 years. Another possible source of infection is a companion who died of phthisis 2 years ago, but inquiry failed to make clear which—the patient or her companion—was ill first. (B.)

Case 714. M. 28.—Had had cough and spit for 10 years. Up to 5 years ago was intimate with a cousin who died 3 years ago of phthisis. During the last 2 years of this man's life, though they still met occasionally, there was much less intimacy. (B.)

Case 782. F. 30.—Ill 6 to 7 years. Sister-in-law died 2 years ago after a prolonged illness. She had had cough for many years. Patient often visited her. (B.)

Case 950. M. 31.—Ill 3 years. Mother died of "bronchitis" and emaciation 1 year ago, at age 54, after several months' (possibly years') illness. Patient's brother died 5 years ago of phthisis; he lived with his mother. Patient was intimate with both, and it is possible that both his mother and himself derived their illness from this man. (B.)

Case 1127. F. 22.—Cough 10 years; failing in health 3 to 4 years. A sister-in-law of patient's brother died 2 years ago of phthisis in a house on the opposite side of the street. Patient often went to see her. The question arises here, how long has patient had phthisis? Also, it is noteworthy that a pawnbroking business is carried on in this house, and that patient, who is a domestic servant, assists in it. Infection from infected clothes is therefore very possible. (B.)

Case 1381. F. 26.—Ill 1 year. Sister died of phthisis 3 years ago. Patient often went to see her, but did not live with her. (B.)

Case 55. F. 53.—Ill 4 years. Brother died of consumption 4 years ago in Salford. Patient did not live in the same house with him, but they often visited each other during the 2 or 3 years of his illness. (McCleary.)

Case 1134. F. 62.—Ill at least 1½ years. Son died of consumption 2 years ago (æt. 26). He did not live with his mother, but he visited her frequently. (C.)

Case 1238. F. 24.—Ill 6 months. Sister died of consumption 6½ years ago after an illness of 12 months. She did not live in the same house, but called frequently. Patient had enlarged glands in the neck about 6 years ago. They were painted with iodine, and disappeared in about 3 months. (C.)

Case 1406. F. 22.—Ill 2 years. Sister died of consumption 12 months ago after an illness of about 2 years. They did not live together, but frequently saw each other. Father and mother also died of consumption, but the dates of death could not be ascertained. (C.)

Patients who had been intimately associated with Consumptives who were not Relatives.

There were 84 of these. Among them some had lived in the same house and come under a previous heading.

Case 231. F. 56.—Ill 10 months. A friend died of phthisis a few months ago; she had been ill 2 years. Patient and she often visited each other. (McCleary.)

Case 266. M. 40.—Ill 3 years. Patient was intimate with a man who died of consumption 2 years ago after an illness of several years. They used to drink together. (McCleary.)

Case 307. M. 33.—Ill 9 months. Patient frequented race meetings. While away from home at these meetings he slept with a man who died of phthisis 9 to 10 months ago. (Coates.)

Case 381. M. 29.—Ill 1 year. A friend died of phthisis 1 year ago. Patient and he were intimate for 2 to 3 years before his death, and during his illness patient often sat with him. (B.)

Case 496. M. 21.—Ill 2 years. Patient used to sit for an hour or so every evening for about 6 months during her last illness with a friend who died about 2 years ago of phthisis. This friend used to spit in her handkerchief and then thrust it underneath her pillow. (Coates.)

Case 685. F. 25.—Ill 2 years. A friend died of consumption in this street 1 year ago. Patient used to see her often. (B.)

Case 844. M. 32.—Ill 6 months. A companion, aged 26, died 2 years ago of phthisis. (B.)

Case 899. M. 3.—Ill 2½ years. A woman who lived next door died of phthisis 2 years ago. She used to nurse and look after patient when his mother was out. (B.)

Case 980. M. 30.—Ill 1 year. Patient has lived at his present address 6 months. Previously he lived in another street where a friend died 6 months ago of phthisis, in a house opposite to this. This friend was often in and out of his house. (B.)

Case 1066. M. 45.—Ill 1 year. The foreman at his place of work died of phthisis a few weeks ago after 3 to 4 years illness; he was often with patient after working hours. (B.)

Case 1100. F. 35.—Ill 6 months. A case of phthisis died 2 months ago in a street near patient's address. Patient tended her at intervals for 9 months previously. (B.)

Case 1180. F. 22.—Ill 18 months. A companion, aged 23, died 8 months ago of phthisis after an illness of 12 months. It is to be noted also that both patient and she worked at the same works for 5 years; they had been companions since childhood. (B.)

Case 1206. M. 26.—Ill 6 months. A friend of patient is at present attending Hardman Street Hospital suffering from "cough and spit"; this man's wife died three years ago after confinement, but she had been "delicate" for a long time previously. (B.)

Case 1264. F. (age not given).—Cough 10 years or more. Failing health 3 to 4 years. A companion died of phthisis one year ago, She lived in a neighbouring street. The length of this companion's illness is unknown, and on this account it is interesting to note that patient used to help her sisters to wash the clothes of a brother-in-law, who died about a year ago of phthisis. (B.)

Case 44. M. 33.—Ill 2 months. A companion died of consumption 1 year ago after an illness of several years. He and patient often visited each other. This companion was very careless as to where he spat, and often spat freely on the floor of patient's house. (McCleary.)

Case 1158. M. 34.—Ill 18 months. Patient is very intimate with a man who has had consumption for over 2 years. They are both very intemperate, and patient sometimes went home with this man and stayed in his house all night. (C.)

Case 1378. M. 31.—Ill 2½ years. A man died of consumption 2 years ago after 4 years illness. Patient and he were inseparable companions, but did not live in the same house. (C.)

Case 1421. M. 27.—Ill 2½ years. Died November, 1901. Three companions of this patient have died of consumption, the last one in August, 1901, and another about 8 years ago. There were eight young men who were companions (patient being one). Now four of them have died of consumption. (C.)

Immediate Neighbours.

Certain cases appear to have been infected by living next door to a consumptive. As mentioned in the Annual Report for 1899, this may be due to the fact that "in the processes of removing dust, shaking carpets, and so on, from an infected house, probably the air becomes sufficiently impregnated with tuberculous dust to infect persons in an adjacent dwelling." It would appear that in New York, which especially suffers from this mode of infection, it is customary to put the bedclothes on the open window to air them. In this group there are 23 cases.

Case 727. M. 18.—Ill 2 months. Two consumptive patients live in the next house; there has been no intimacy between the families, but the yard is common to both houses. Another possible source of infection is the fact that Hardman Street Hospital for Consumption and Diseases of the Throat and Chest is next door, and the patients on coming out of this institution have often been noticed spitting on the pavement. (B.)

Case 728. M. 20.—Ill 9 months. A man died next door to patient's previous address (where he lived a year ago) of phthisis 2 years ago. There was practically no intercourse between the families. (B.)

Case 831. F. 15.—Cough about a month. (?) A case next door (832/01) has been ill 3 years; there has been no intercourse between the families, but both houses are dirty. (B.)

Case 851. M. 39.—Ill 4 years. Case 45/01 lives next door, ill 8 years. There has been no intercourse between the families, this patient not even knowing of the existence of the other one. (B.)

Case 876. M. 43.—Cough 9 to 10 years. Failing health 2 years. A man died 5 years ago next door of consumption. In this case there has been some intercourse, but the amount of intercourse was slight. (B.)

Case 1056. M. 20.—Ill 6 months. Patient has been living at his present address 4 months. Next door to his previous address there lived a consumptive, who is at present very ill. Patient and this man were brought up together, but have had little intercourse during the last 5 years. Patient never was in this man's house. (B.) In connection with this case the possibility of infection by milk arises. This will be discussed later.

Case 1175. M. 11.—Ill 6 months. In a side street off the street where this patient lives a man died of phthisis after an illness of 2 years. Although in different streets, the houses are so arranged that their yards are close together, but do not actually adjoin. It is stated, however, that carpets, etc., are not beaten in the passage between the houses or in the respective yards, but in a croft near by. (B.) This is a very doubtful case, but no other cause was detected.

Case 1205. F. 32.—Cough 8 years, failing health 6 to 8 months. Patient has been in this house 3 years. About a year ago a woman died next door with cough, spit, and emaciation. Patient had no intercourse with her, though patient's landlady often went to see her, but she never came into this house during the 2 years of patient's stay included in her life. Previously however, she had often been in. (B.) It is to be noted, however, that in this case the patient's work is suspicious, in that she cleaned offices and also did charing work at a beerhouse once a fortnight.

Case 734. M. 43.—Ill 6 months. Case 1257/01 next door, though notified at a later date, is much more seriously ill than this case; and, though the duration of illness given is the same, is stated to have had tubercular peritonitis 3 years ago. There has been no intercourse. (B.)

Case 1258. F. 31.—Cough many years. Failing health 6 months. Case 956/00 lived in the court at the back of this house for 3 years. The houses are built on a slope at the back, and are so made that the houses that open into the court are the lower storeys of the houses that open into the street. Case 956/00 lived in the dwelling underneath the next house, and was ill of phthisis all the time that he lived there. Patient has lived in this house for 15 months. (B.)

Case 66. F. 16.—Ill 2½ years. Case 65/01 for 9 years lived next door to patient, and was consumptive 4 years. There was no intimacy between patient and this case, but patient's mother nursed this neighbour in her last illness. (McCleary.)

Case 67. M. 35.—Ill 2½ years. Father of case 66. Infected from the same source. (McCleary.)

Case 1266. F. 35.—Ill 7 months. Case 109/99 has had consumption for 7 years, and has lived next door to patient for 3½ years. There was practically no intercourse between the families, although the patients occasionally met in the yard behind. Another possible source of infection in this case is that the previous tenant in this house had consumption. The floors were very dirty, but the walls and ceilings had all been limewashed and the living-room papered before the patient came here. (C.)

House Infection.

In 12 cases patients may have contracted the disease by living in houses which had been infected by previous consumptive tenants. It is rarely that anything is known by the patient or his relatives of the previous occupants of any house in which they have lived. Hence the infrequency with which the disease can be attributed to this cause. A special report on an investigation into the subject was made by Dr. Beatty to the Medical Officer of Health during the year, but this report had no reference—save in one case—to the cases quoted here.

Case 407. M. 31.—Ill 6 months. Investigated April, 1901. Patient came to live in his present house 6 weeks ago; but previously from Christmas, 1899, to Christmas, 1900, had lived in a house in which a young woman had suffered from "bronchitis" before he lived there. This woman died in one of the Union Hospitals while he was living at that address. The objections to this explanation are that he is a hawker of greengrocery, and had therefore much to do with Shudehill Market (mentioned later), that he was very intemperate, and therefore exposed to infection in public-houses. (B.)

Case 465. M. 9.—Ill since infancy. This child has had very frequent and troublesome attacks of diarrhœa up till the age of 6. His grandmother died 20 years ago. Ten of his father's brothers have died of phthisis, the first 19 years ago, the last 9 years ago, *i.e.*, just before he was born. These uncles probably visited at his home. (Coates.)

Case 748. M. 18.—Ill about 3 years. Patient has lived at the address where his relatives were found only one night, but previously lived at another address for 3 years. Shortly before patient went to live there a man had died in it of consumption. There is no family history of phthisis, but little was known of patient's companions or workfellows. (B.)

Case 1203. M 23.—Cough 7 years; failing health 3 years. Patient came to live at present address 6 months ago, had previously lived at another address 2 to 3 years; at this address case 227/99 had lived for many years, but had removed one year before his death in 1899. Patient is a total abstainer, and there is no family history of phthisis. The objection is the doubt as to the date when the disease commenced; phthisis may have been grafted on bronchitis. (B.)

The history of the following case is suspicious :—

Case 559. M. 31.—Ill 4 years. About 6 to 7 years ago patient lived in a house in which a man died of phthisis while he was there; the housekeeper died of the same shortly after he left, and another man who lived in this house is at present suffering from phthisis. There seems to have been little intercourse between patient and any of these cases. (B.)

Case 912. F. 35.—Ill 1 year; may have been 2 to 3 years. Patient has lived in this house 2¼ years. (July, 1901.) A case of phthisis died in this house on May 30th, 1898. The only other possible cause discovered was that a sister-in-law died 7 years ago cf phthisis and that patient used to clean up for her. Patient stated, however, that she had been quite well up to 2 years ago. (B.)

Case 43. F. 8.—Ill 3 months. A man lived in this house for a year, leaving one year ago. He had consumption all the time. House was not beautified when patient came here 8 months ago. (McCleary.)

Case 1276. F. 17.—Ill 8 months. Patient has lived in this house for 2 years. A young woman died of consumption in this house about 3 years ago. It was stated that she was nursed and died in the small back bedroom which patient occupied up to 3 months ago. The house was very clean when present tenant entered it, but it had not been specially cleansed and beautified. There was no family history of consumption, and the only other possible source of infection discovered was that her mother was a dressmaker, and mended and altered dresses. (C.)

Case 1288. M. 43.—Ill 4 years. About 5 years ago patient went to live at a house where the previous tenant had died of consumption a few months before after an illness of several years. The house was not cleaned or beautified when the patient went to live there. (C.)

Case 1200. M. 28.—Ill 14 months. This case previously lived at a house where the tenant before him had died of consumption. The house was cleaned by the patient brushing down the walls with a dry brush, etc. He lived in that house for 1 year, leaving 2 years ago. Another more probable source of infection in this case is that for 2½ years patient has worked next to a man who has a very bad cough and spit, and who was very careless as to the disposal of his sputum. (C.)

Case 1496. M. 39.—Ill 1½ years. Four years ago patient went to live at a house where the previous tenant had suffered from consumption for 8 years. (C.)

Milk.

In the following case, the primary infection may have been milk-borne :—

Case 232. M. 19.—Ill 6 months. Patient died in January, 1901, with the symptoms of tubercular meningitis. His mother was a milk dealer, and he helped her in the shop, and also drove the milk cart. He was very fond of milk, and drank it in large quantities, sometimes warm, sometimes cold. The addresses of the farmers from whom the milk was obtained were found, and J. S. Lloyd, M.R.C.V.S., a veterinary surgeon to the Manchester Corporation, states that a sample of milk was taken from a consignment of milk from one of these farmers, and was found to contain tubercle bacilli. In consequence he visited this farm, and discovered a cow with extensive tubercular disease of the udder on December 13th, 1900. Mr. Lloyd is of opinion that the disease of the udder had lasted at least 6 months, and possibly 12 months. There is no family history of phthisis in this case, and no other cause was detected. (McCleary.)

Public-houses.

A source of infection which must not be overlooked is the beerhouse. In some cases patients have been employed in beerhouses and public-houses, in others they frequent particular houses, and in others again they are constantly in beerhouses, though they do not confine their attention to any particular one. That these houses can be a source of infection is clear from the amount of spitting on the floor which takes place in them, especially in those of the lower class. In most cases the patients cannot tell of any particular consumptive who frequented the house, but in some cases a definite history of this kind can be obtained.

Case 338. M. 36.—Ill 1 year. Patient was a barman; "the tap room in which he was employed was always full of men, many of whom spat on the floor." Nothing, however, was known of this patient's family history or companions. (Coates.)

Case 484. M. 38.—Cough for many years, seriously affected for 2 to 3 months. During the last 12 months patient has been employed to sweep rooms, clean windows, etc., in a public-house. The disease, however, may have been in existence before he took up this employment, for he was a hawker, in which class phthisis is common. (B.)

Case 503. M. 38.—Ill 1 year. Patient's habits are very intemperate. During the winter of 1899-1900 he used to spend whole days at a time in a favourite public-house. (B.)

Case 815. M. 21.—Cough 3 years. Patient was a chef, but was employed for short periods only, and between these periods he lived at home. The family kept a public-house up to 18 months ago; they remember that some of their customers spat on the floor, and they know of one or two who have died of consumption. (B.)

Case 880. F. 34.—Ill 1½ years. About 3 years ago patient used to go regularly to a public-house; she noticed that one or two of the customers had severe cough and spit, and spat on the floor. The patient herself in this case was seen, but no other source of infection was detected. (B.)

Case 965. M. 24.—Ill 5 years. Patient, a cab-driver for 3 years and before that a stableman, was very intemperate. He used to spend hours in an "hotel"; he stated that the customers spat about the floor. (B.)

Case 1106. M. 32.—Ill 2 years. During the last 5 years patient has worked during the morning at a public-house—sweeping, cleaning brasses, going errands, etc. This public-house was the favourite resort of case 1147, though he apparently did not contract the disease there, but from a workfellow. (B.)

Case 1304. M. 45.—Patient stated that he has had a slight cough all his life, but was quite strong up to about a month ago, when he had hæmoptysis. He has been a beer retailer all his life, and has been in the present beerhouse for 10 years. There is no definite history of any consumptive frequenting this beerhouse, but spitting on the floor is freely indulged in. (C.)

Case 1407.—Ill 1½ years. Patient has been a night watchman for 2 years, and before that was a barman for 30 years. Sister-in-law, who was the informant in this case, stated that she never heard patient speak about any consumptive person frequenting the bars where he worked, but undoubtedly much spitting took place there. Patient's brother died of consumption in this house 8 years ago. Patient has lived here for 11 years, but there was no history of failing health prior to 1½ years ago. (C.)

Case 1408. M. 35.—Ill 3 years. Patient has been a barman in a certain public-house for 7 years. There is no family history of consumption, and no other source of infection was ascertained. (C.)

Case 1260. F. 31.—Ill 3 months. Patient did her own house work till about 1½ years ago. Since then she has frequently swept out the bar-room of a public-house. (B.)

Infected Clothes, &c.

Such things as clothes, books, furniture, may harbour tubercle bacilli if used by a consumptive patient, and later be the medium of spreading the disease.

Case 937. M. 38.—Ill 5 years. Patient was a lurry-driver, and worked therefore in the open air. The only evidence of consumption in his family is that a brother died of it 20 years ago. About 5 years ago he bought some second-hand clothes—a coat and waistcoat—and wore them about a month. He found then that the man who had worn them had died of a "galloping consumption." Patient had had a cough before, but was much worse afterwards. It is stated that sputum marks could be seen on these clothes. (B.)

Case 779. F. 35.—Ill 2 years. This is a very doubtful case as regards source of infection. Patient's father died 30 years ago and her sister 20 years ago of consumption, and a cousin with whom she was intimate died 13 years ago of the same. A year afterwards she married this cousin's husband, and remained apparently well for 10 years, when an attack of pleurisy occurred, since which the disease has developed. She has apparently never, during the last twelve years, been in association with a consumptive, but there are books in the house used by her husband's first wife, her own cousin, who died of phthisis. (B.)

Infected furniture.—There are only two cases in which the circumstances seem to point somewhat in this direction :—

Case 1204. F. 16.—Cough 10 years. Failing health 2 years. Patient's father died of pneumonia 2½ years ago after 10 days' illness, but there is a history of his having suffered from cough and emaciation for 3 years previously. Her father's illness would account for patient's illness, but it is more difficult to account for the father's illness. In the sitting-room there is a couch which was bought five or six years ago from a man who died later of consumption, and is believed to have had the disease for some years before the time when he parted with the couch. Patient's father used this couch regularly; and though he had a winter cough previously, it is from about this time that he commenced to fail in health. (B.)

Case 1489. M. 45.—Ill 2½ years. Patient is a slipper maker, and often bought old carpets to make carpet slippers. These had to be thoroughly brushed and cleaned before using, and in doing this the patient was exposed to a great deal of dust. There is no family history of consumption, except that a son died 18 years ago after amputation of the foot for caries. (C.)

Amusements.

Places of amusement may, in some cases, be the source of infection :—

Case 1169. M. 29.—Ill 5 years. In this case there is no family history of phthisis, and no history of association with a consumptive. Patient was very fond of dancing, and used to dance often at a place in Manchester which is greatly used for this purpose. He stated that the atmosphere becomes very dusty, and that the people using it spit often about the floor—that, indeed, this is "a regular practice." (B.) It is to be observed, however, that his work, that of a grocer, involved his working in a shop while the floor was being swept. Spitting, however, in this class of shops is not freely indulged in.

Case 813. M. 26.—Ill 6 months, probably longer. Investigated June, 1901. In this case no cause could be detected except that patient used to dance about once a week at a dancing-room during the winter of 1899-1900. (B.)

Case 817. M. 20.—Ill 1 year. The source here may be a work-fellow, aged 60, who coughed a great deal and spat on the floor of the workroom. Considering the great probability that this man's case was only one of chronic bronchitis, it is interesting to note that the only other clue obtained was that the patient often goes to the pit of one of the smaller theatres, and that there is a good deal of spitting there. (B.)

Case 576. M. 15.—Ill 9 months. This patient frequents the same theatre, but there are other possibilities—he works at a dye-works; also a brother, aged 4 years, died 4 years ago of consumption of the bowels after being ill for 1 year. (B.)

Churches, &c.

The possibility of infection in places of worship should not be overlooked.

Case 1357. M. 53.—Ill 2 to 3 years. Patient attends frequently one of the Mission Halls; he knows of several regular attendants who have from time to time died, one or two of "asthma." He stated that there was no spitting in this hall except into handkerchiefs.

Work.

Turning now to the occupations followed by the consumptives on our records, these, excluding those employed merely on housework in their own homes, are given in 730 cases. It will be found later that, on the whole, the occupations showing the greatest numbers are also those in which the patients have been most exposed to infection during their work.

Ironworkers	68
Warehousemen, including Packers	43
Sewing Machinists	43
Engaged in Cotton Mills	43
Workers in Wood	38
Tailors	35
Charwomen and Office Cleaners	26
Railway Employees	23
Clerks, various	23
Workers in Rubber	20
Bar Tenders, etc.	20
Stablemen, etc	19
Market Porters	18
Hawkers, mainly of vegetables	17
Printers, Binders, etc.	15
Dyers	17
Engaged in Gasworks—mainly Stokers	12
Porters, various	12
Soldiers	11
Painters and Decorators	10
Workers in Brass and Copper	7
Shoemakers	9
Hatters	3
Workers in Paste and Glue, apart from Binders	6
Furriers	5
Furniture Brokers and Upholsterers (see also Railway Employees)	7
Glass Workers	6
Scavengers	2
Rag Sorters	4
Grocers	4
Butchers	1
Tobacco Workers	2
Plumbers	6
Stonemasons	6
Laundresses	9
Velvet and Fustian Workers	9
Blacking Workers	4
Domestic Servants	7
Policemen	5
Clay Pipe Makers	2
Various	113
Total	730

Cases in which infection was probably acquired while the patients were engaged in following their daily occupations :—

Warehousemen (in the Cloth Trade).

"In most of these warehouses chronic cough appears to be very common; according to the statements of patients who have been visited, the men invariably spit about the floor, etc. There is a good deal of dust (china clay and sizing) given off while handling the cloth, and this dust will no doubt excite coughing and spitting in those suffering from chest affections. The sputum mixing with the dust will dry more rapidly, and be disseminated in the atmosphere."—(Annual Report, 1900.)

Case 325. M. 58.—Ill 2 years. About 3 years ago a man who had worked next to patient for about 2 years died of phthisis. This man used to spit on the floor. (Coates.)

Case 572. M. 46.—Ill 7 years. Two men who worked at the same warehouse as patient under his supervision died of phthisis, one 10 years the other 7 years ago; they spat on the floor. (B.)

Case 765. M. 49.—Ill 1 to 2 years. A workfellow is at present attending the Consumption Hospital. There is no evidence as to which fell ill first. (B.)

Case 1147. M. 46.—Ill about 1 year. A workfellow in the same room died of phthisis 2 to 3 years ago. (B.)

Case 1243. M. 22.—Ill 8 months. A workfellow died of consumption 9 months ago. He was ill for a year or more, and spat freely on the floor. He worked in the same room as patient for several years. Another workfellow some time before this was said to have consumption. He went abroad, and came back to work about 9 months ago, said to be cured. (C.)

In other cases the cause is less probable :—

Case 661. M. 46.—Ill 3 to 4 years. In this case no definite information as to cause could be got from the informant, an aunt of the patient, but it appeared he worked at the same warehouse as case 325, mentioned before. (Coates.)

Case 721. M. 22.—Ill 1 year. (June, 1901.) Patient stated that several of his workfellows are "ailing," and one or two have been off work lately. (B.)

Case 1471. M. 38.—Failing health 2 years. Cough 1 year. A workfellow, an elderly man, had cough and spit, but seldom spat on the floor, and if he did would wipe it up. (B.)

Other cases have occurred at this warehouse:—

Case 55/00. M. 22.—Ill $1\frac{1}{2}$ years. Packing department till a year ago. Since then carries goods from one department to another; has worked here 9 years.

Case 1082/00. M. 19.—Ill 4 months. Here till 5 months ago. Another but very doubtful source of infection present.

Case 1309/01. M. 21.—Ill one year. Clerk and collector in the counting-house for 8 years.

There are therefore four cases in the last two years recorded, and in only one of these cases has another cause been found, and that a very doubtful one.

Iron Workers.

Those patients who work in iron almost invariably declare that the trade is a very dusty one; in many cases, also, the element of heat is superadded. As the dust is largely metallic, the delicate epithelium of the air passages is readily injured by it, and the extremes of heat and cold to which the patients are often subjected intensifies the process. Workers in this trade are therefore especially liable to furnish a suitable soil for the growth of the tubercle bacillus.

Case 790. M. 28.—Ill 3 to 4 months. Patient has been a planer's labourer in a large ironworks for 13 years. The planer for whom he works suffers from cough and spit, and patient states that one of this man's brothers has already died of phthisis. (B.)

Case 817. M. 20.—Ill 1 year. This case has already been mentioned under the head "Places of Amusement." In the present connection it is noteworthy that he has been a driller in a very large works for 6 years. (B.)

Case 839. M. 28.—Ill 7 years. Patient has been a planer at his present place of work 8 years. While there is no history of association with a definite case of phthisis, it is stated that several of his workfellows at the same works have had in the past to cease from this work through illness. (B.)

Case 869. M. 37.—Ill 1 to 2 years. Patient has been an engine-fitter for 9 years at his present place of work; a workfellow of his is "delicate" and has a cough. (B.)

Case 1160. M. 23.—Ill 3 months. Patient was a grinder of flyers up to six months ago, but was then transferred to the engine room. A workfellow who is said to be consumptive worked at the same place but not in the same room as patient. Patient saw him frequently. (C.)

Case 1268. M. 37.—Ill 2⅓ years. Patient is an iron-turner. An intimate companion who worked at the same place died of phthisis 7 years ago. Also many other cases have been reported from the same place of work. (See case 558.) (C.)

Case 1404. M. 38.—Ill 18 months. Patient is a labourer in a large ironworks. He states that many of his workfellows have had bad coughs and spat freely during the last three years, and he believes they had consumption. Many other cases reported from same place of work. (See case 558.) (C.)

Other cases are only suspicious on account of the place in which they have worked.

Case 558. M. 24.—Cough 8 to 9 years. Patient worked at this place for 8 years up to 2 years ago. (B.)

Other cases recorded as having worked here:—

Case 104/99. M. 19.—Ill 3 to 4 years. Moulder.

Case 214/99. M. 39.—Ill 3 years. Labourer; has not worked here for last 2¾ years.

Case 227/99. M. 50.—Ill 9 months. Labourer in turning room.

Case 602/00. M. 15.—Ill 1 year. Fitter.

Case 994/00. M. 27.—Ill 1 year. "Ironworker."

Case 1081/00. M. 14.—Cough several years. Iron-turner; pneumonia 2 years ago.

Case 1229/00. M. 17.—Ill 1 year. Moulder.

Case 1232/00. M. 18.—Ill 1½ years. Iron-fettler here till 1 year ago.

Case 1234/00. M. 40.—Ill 6 months. Fitter.

Case 1004/00. M. 28.—Ill 2 months. A shoemaker by trade, but for the last 8 months has worked here.

Case 230/01. M. 31.—Ill 2 years. Labourer.

Case 453/01. M. 22.—Ill 3 years. Iron-turner.

Case 1203/01. M. 23.—Failing 3 years. Labourer here for last 2 years.

Case 1232/01. M. 49.—Ill 6 months, probably longer. Labourer here for the last 2 years.

Case 1268/01. M. 37.—Ill 2⅓ years. Iron-turner 18 years; left work 1½ years ago.

Case 1404/01. M. 38.—Ill 1½ years. Labourer 8 years; left 9 months ago.

Case 1062/01. M. 50.—Ill 4 months. Engine-maker 5 years; left 2½ years ago.

Case 1056/01. M. 20.—Ill 6 months. Fitter 2 years; left about 3 years ago.

Case 1171/01. M. 40.—Ill 2 years. Labourer 1 year; left 3½ years ago, previously worked in the dyeworks mentioned last year.

These last 3 cases probably neither caught the disease while they were working at this works, nor were affected with the disease while here.

Out of the 20 cases recorded, 3 are probably entirely unconnected with this ironworks. In 4 cases another source is present; in 1 case a very doubtful source is present, viz., case 1232/01, ill 6 months, probably longer; patient's brother died 5 years ago of Phthisis. There are, therefore, at least 12 cases in which no other cause was found; and, among these, in cases 1229/00, 1234/00, 1268/01, 1404/01, there was a definite history of consumptive workfellows obtained from the patient

Case 900. M. 29.—Ill 6 months, possibly 3 years. Patient has been a fitter at this works for the last 11 years. (B.) Previous cases reported :—

Case 391/99. M. 55.—Ill 1 year. Iron dresser; here 22 years.

Case 480/00. M. 47.—Ill 1 year. Grinder; here 14 years.

Case 523/00. M. 21.—Ill 4 years. Spindle maker; not at this works for the last two years.

Case 530/00. M. 28.—Cough since childhood. Iron turner; not at this works for the last 8 years.

Case 675/00. M. 19.—Ill 2 years. Engineer.

Case 421/00. M. 52.—Ill 6 years. Grinder.

Case 758/01. M. 24.—Ill 4 months. Iron turner; 4 years here.

In this case there are two foundries belonging to the same firm. From the first come cases 900/01, 391/99, 480/00, 675/00, 758/01.

In cases 675/00 and 758/01 another source was found; there are, therefore, 3 cases over 2¼ years otherwise unaccounted for. In case 480/00 a definite statement of cough and spit among his workfellows was obtained.

From the second foundry come cases 523/00, 530/00, and 421/00. In the first two of these another cause was found; while in case 421/00 there is a statement of Phthisis among his workfellows. There is no case reported from this foundry during 1901.

It is altogether doubtful, therefore, whether the foundries belonging to this firm can be considered a source of Phthisis in their workmen.

Case 1477. M. 36.—Ill 7 years. Patient was a striker in a large ironworks for 12 years. He left 4 years ago. His wife, who was the informant in this case, never heard him speak of any of the other workmen having Consumption, but many other cases have been recorded as working at the same place. (C.)

Other cases recorded:—

Case 323/00.—Ill 6 months. Labourer.

Case 1146/00.—Cough for many years. Striker.

Case 371/01.—Ill 2 months. Iron dresser.

Case 561/01.—Ill 2 years. Labourer.

Case 570/01.—Ill 1½ years. Labourer for puddlers.

Case 997/01.—Cough for 10 years, failing health 1½ years. Ironworker 28 years.

Case 1267/01.—Ill 1 year. Blacksmith 11 years.

Case 1327/01.—Ill 3 months. Labourer 6 months.

Case 1352/01.—Ill 6 years. Iron-dresser here for 6 months, ending 3 years ago.

Of the above cases, one (1327/01) may not have been Phthisis, as no tubercle bacilli were found in his sputum; another possible source also has been found in his case. Case 1352/01 came to this ironworks after he was affected, and was not long there. Cases 1261/01 and 997/01 have other causes assigned to them. Of the remainder, two (viz., cases 570/01 and 371/01) have very doubtful sources assigned them; for the remaining four no other source was found.

Printers.

An inquiry into the occurrence of Phthisis among printers and lithographers is of special interest in view of Dr. Edward Smith's statement in his report to the Privy Council in 1863 that the great foe of the printer is Consumption and other forms of chest disease, and in view also of Dr. Arlidge's statement as to the causes of death among 799 compositors who died in the ten years 1880–1889 inclusive. This is as follows:—

Phthisis	37·03	per cent.
Bronchitis	10·63	,,
Pneumonia	8·38	,,
	56·04	

In other words, in these 799 cases chest complaints were responsible for more than half the mortality. As there are given in Slater's Directory for Manchester and Salford the names of 320 printers, it is surprising that this trade is not more prominent in our lists.

Letterpress Printers	5	(including "feeders").
Lithographic Printers	5	
Folders and Binders	3	

Case 520. F. 19.—Ill 5 years. Five years ago patient worked for 1 year stamping and folding papers at a printing works. It is stated that she "caught a cold" when there, was in bed for 3 months, and never really got rid of the cough since. (B.)

Other cases reported from this works:—

Case 185/99. M. 31.—Ill 2 years. Stationery cutting.

Case 265/99. F. 32.—Ill 6 years. Folder and bookbinder.

Case 269/99. F. 26.—Ill 3 to 4 years. Envelope maker.

Case 35/00. M. 57.—Ill 6 years. "Printer."

Case 281/00. M. 32.—Ill 2 years. "Printer."

Case 492/01. M. 30.—Ill 4 months. Compositor; here 1 to 2 years.

Case 703/01. F. 22.—Ill 5 months. Folder and bookbinder; was here 7 years; left 3 years ago.

Case 881/01. M. 48.—Ill 2½ years. Lithographic printer; here 25 years.

During the year, therefore, of 5 letterpress printers, 1 came from this works; of 5 lithographic printers, 1 came from this works; of 3 folders and bookbinders, 2 came from this works, and the other bookbinder had not worked in Manchester at all.

With regard to case 492/01 it is to be noted that the patient had two consumptive acquaintances, one died 4 years and the other 3 years ago, but he did not associate much with either.

Case 703, a woman who was both a companion and workfellow died 3 years ago of Phthisis.

In case 881 no other source of infection was detected.

Of the 9 cases recorded, 2 have other sources assigned to them, and another has a doubtful cause assigned; in the remaining 6 no other source was detected, and in 2 of them it is definitely stated that workfellows suffered from Phthisis.

Dyers.

During the year 16 cases have been investigated who were employed in various dyeworks. Of these, 7 were employed by the firm mentioned last year as having probably a centre for infection in their works. It is proper to state that there are two places of work belonging to this firm, and that it is not clearly stated in our records, in many cases, which of these was the place where the patient worked. The place chiefly indicated has since been closed. The cases up to date are as follows :—

Case 381/99. M. 57.—Ill 8 years. Here 20 years. Left 5 to 6 years ago. Foreman velvet cutter. First works.

Case 342/99. M. 19.—Ill 2 years. Velvet cutter. First works. Here 5 years.

Case 245/00. M. 22.—Ill 7 years. Velvet cutter. First works. Here 9 years.

Case 122/00. M. 35.—Ill 1 year. Left the works 1 year ago.

Case 128/00. M. 57.—Ill 5 years. Left 4 years ago.

Case 284/00. M. 52.—Ill 3 years. Worked here 30 years, and had to leave 3 years ago on account of illness.

Case 194/00. M. 38.—Little known.

Case 333/00. M. 27.—Ill 3 years. Left 2 years ago.

Case 467/00. M. 39.—Ill 3 years. Worked here 3 years. Left 1 month ago. Labourer.

Case 936/00. M. 18.—Ill 3 years.

Case 331/01. M. 39.—Ill about 1 year. Labourer. Has not worked here for 6 months.

Case 928/01. M. 21.—Ill 9 months. Velvet dresser for 5 years up to 1 year ago. First works.

Case 970/01 M. 58.—Little known. Was at this dyeworks for an unknown period up to 6 months ago.

Case 1142/01. M. 19.—Ill 9 months. Works at the second works.

Case 1171/01. M. 40.—Ill 2 years. At second works up to 4 years ago for several years.

Case 1271/01. M. 33.—Ill 1 year. At second works for 1 year up to 1 year ago.

Case 1291/01. F. 41.—Ill 1½ years. Patient was not employed here, but hawked cushions stuffed with flocks obtained at second works.

Case 963/01. M. 36.—Ill 1 year. Worked here for 10 years "jig-dyeing." Left 2½ years ago.

Case 936/00. M. 18.—Ill about 3 years.

Case 1171/01.—Probably neither contracted the disease in this works nor had it while he worked here.

Case 1291/01.—Did not work at the second works, but the suggestion is that if much spitting went on there the flocks obtained there might easily be infected.

There remain 17 cases.

Summary.—First works: 381/99, 342/99, 245/00, 928/01. Since closed.

Second works—1142/01, 1271/01.

Not stated—the remaining cases—11.

Other possible sources have been found:—

First works—342/99, 928/01.

Not stated—128/00, 467/00, 963/01, 936/00.

There remain 10 cases not accounted for in any other way. Of these, in two—194/00 and 970/01—very little was known to the informant; but, on the other hand, a definite statement of the existence of workfellows with cough and spit was found in

First works—245/00

Second works—1271/01.

Not stated—284/00, 331/01.

Girls and Women employed in making Underclothing and Dresses.

Case 372. F. 26.—Ill 1 year. Patient is a cap-cutter. A workfellow, aged 26, died of phthisis 6 weeks ago; patient was very friendly with her. (B.)

Case 606. F. 36.—Ill 5 months. Patient is a machinist. In the same workshop on the next machine was a workfellow who had a chronic cough, and died 2 to 3 months ago. The association lasted about 3 months. (B.)

Case 733. F. 30.—Ill 9 months. Patient was a dressmaker, worked at home for customers of her own. She often made alterations in clothes, but did not know of anyone for whom she worked who might have had phthisis. (B.)

Case 786. F. 30.—Ill 1 year, possibly 3 years. Patient was a mantle maker, worked at a costume makers for 2 years up to 3 years ago. (B.)

Other cases from this factory:—

Case 168/99. F. 19.—Ill 3 years. Machinist. Here 2 years; left 1 to 1½ years ago.

Case 394/01. F. 29.—Ill 1 year. Managed a department some years; left about 9 months ago.

Case 710/01. F. 15.—Ill 7 weeks. Worked here 3 months; left 2 months ago.

Case 1204/01. F. 16.—Failing health 2 years. Here 6 months; left 1¼ years ago. Granted the accuracy of the dates, this case was ill before she went to this factory.

In one case of the above (1204/01) another source has been found.

In cases 168/99 and 710/01 another very doubtful source has been found.

In the remaining two cases no other source was detected.

Office Cleaners, &c.

Work involving the inhalation of dust rising from floors seems to be peculiarly liable to produce Phthisis. Such work as office cleaning, sweeping of floors, general charing work, is subject to this risk. The special risks in doing this work in public-houses have been previously mentioned.

Case 600. M. 38.—Ill 9 months. Cough 4 years. Patient cleaned offices at a place in Deansgate for 1¼ years. Ceased this work 1½ years ago. He first developed a cough while in the army in India 4 years ago, but was apparently in good health till 9 months ago. This is probably a case where phthisis developed in a chest predisposed by bronchitis. (B.)

Case 662. F. 36.—Ill 1 year. Patient has been a charwoman at various common lodging-houses. (Coates.)

Case 785. M. 35.—Ill 7 years. Patient has lived in Manchester for 6 years, working at two ironworks—these are not implicated to any extent of importance in our records—and previously for 10 years was in the Royal Marines. On the last ship in which he served before leaving the Navy it was one of his duties to beat the carpets belonging to the officers' rooms. One of these officers was "delicate," and suffered from cough and spit. Patient complains of the extreme dustiness of this part of his work. (B.)

Case 814. F. 33.—Ill 6 months. Patient's husband is a watch repairer, and keeps a small shop. His customers occasionally spit on the floor. Patient used to sweep and clean this shop regularly. No other source of infection was detected. (B.)

Case 1179. M. 26.—Ill 2 months. Patient has been three times in prison during the last 3½ years. The total amount of time he has so spent being 2 years. The work he was set to was the sweeping out of the cells and passages. He often noticed sputum on the floors of these. (B.)

Case 1245. M. 36.—Ill 8 to 10 years. Patient was in the army up to 8 years ago. During the latter part of his army life he was librarian at a military library in Gibraltar, much used by the soldiers, who occasionally spat on the floor. Patient had the cleaning and sweeping of this place to do. (B.)

Washerwomen.

Washerwomen, dealing as they must do with the handkerchiefs of careless phthisical patients, are exposed in a peculiarly intense degree. It is remarkable, therefore, that more laundresses do not appear on our lists. Only 9 are mentioned during the year, and no two of these worked at the same laundry. As possible explanations it may be observed that charwomen often do laundry work, and that cases really due to the handling of infected handkerchiefs are set down as due to sweeping, also soiled handkerchiefs are not opened out, but simply placed in hot water at once, and the atmosphere during the time when they are handled is saturated with moisture, so that the germs do not readily impregnate the air. Further, handkerchiefs are probably often washed at home.

Case 892. F. 41.—Ill 3 to 4 months. Patient is a washerwoman. During the last 3 or 4 months she has washed at a house where one of the daughters has "no lungs." She has to wash the handkerchiefs used by this woman, and states that they are stained yellow, and of "disgusting" appearance. (B.)

Case 1084. F. 31.—Ill 3 years. Patient worked at a laundry for 1 year; left it 3 years ago; has taken the washing home since then up to 1½ years ago. She stated that the work was very severe and the hours long, and that she often had to wash handkerchiefs, but does not know, as regards the laundry work, where these came from. There is no family history of phthisis, and no other cause was detected. On the other hand, there is a conflict of medical opinion in the case, and patient's present attendant declares that phthisis is not present. (B.)

Railway Carriages.

Spitting in railway carriages, apart from the æsthetic objection, appears to be a source of infection. Those most exposed to this risk are carriage cleaners and those whose duty it is to renovate old carriages by re-upholstering or re-painting them. It is obvious in the case of carriage cleaners how dust can arise, and considering that upholsterers have to strip off old cushions it is easy to see how they may become infected by germ-containing dust. The case is different with painters, but the risk becomes clear when it is explained that these painters deal with the carriages after the upholsterers have stripped them, and that dust lodges in cornices and ledges which must be brushed off before painting is possible.

Case 618. M. 49.—Ill 3 years. Patient has been a railway carriage cleaner for the last 15 years. Left work 8 months ago. No family history of phthisis, and no other source of infection detected. (Coates.)

Case 935. M. 20.—Cough since childhood. Seriously affected 4 months. Patient a total abstainer. Worked as a carriage cleaner for 6 months, but left this work when he became seriously affected. It is stated that the case was one of "galloping consumption," so it is possible that his work caused tuberculosis to settle in a lung already predisposed by the bronchitis evidenced by the cough which had lasted since childhood. (B.)

Case 1165. M. 28.—Ill 4 years. Patient has been a carriage cleaner for the last 8 years. He has to sweep the carriages and beat the cushions. (B.)

Case 691. M. 35.—Ill 2 years at least. Patient is a coach trimmer and upholsterer, and renovates old carriages. It must also be mentioned that a niece, aged 7, is said to have been treated at the Children's Hospital for consumption 3 years ago, but is now apparently in good health. Also, patient is very intemperate. (B).

Case 915. M. 40.—Ill one year. Patient has been a painter at this railway works for the last 6 years. He has to paint both new and old carriages, and he describes his work as dusty, for the reason given above. A consumptive patient who worked in the same gang, but not in association with patient, died 2½ years ago. (B.)

Case 796. M. 48.—Ill 1 year. Patient has been a painter for the last 3 years at the same works as case 915, and works under the same conditions, except that he stated that the upholsterers would often be at work at the same time as he was in the carriage, and that the dust was therefore often very noticeable. He stated, also, that many in his workshop spit, and that two or three have died of consumption since he took up his work 3 years ago. (B.)

Other cases from the same works, but not necessarily from the same department :—

Case 505/00. M. 45.—Ill 1 year. Wheelwright.

Case 507/00. M. 38.—Ill 1 year. Iron turner.

Case 556/00. F. 45.—Ill 4 to 5 years. Office cleaner.

Case 1042/00. M. 28.—Ill 3½ years. Tinplate worker. For three months he worked at the next bench to a man who died of consumption 4 years ago.

Case 1271/00. M. 48.—Ill 9 months. Wheel turner.

Case 32/01. M. 33.—Cough 5 years. Grinder.

Case 773/01. M. 15.—Ill 6 months. In carriage department 12 to 14 months.

Case 854/01. M. 31.—Ill 6 months. Striker at blacksmiths. Here for 4 months 3 months ago. Probably affected before coming here.

Case 685/00. M. 23.—Ill 4 months. Joiner.

Case 1176/01. M. 21.—Ill 2 months. Breaker-up of old railway carriages.

Case 1378/01. M. 31.—Ill 2½ years. Painter's labourer. Worked here for four years 1½ years ago.

Case 854/01 was probably affected before he worked here; and in cases 507/00, 556/00, 1271/00, 685/00, and 1378/01 other causes have been found. Of the 7 remaining cases, 5 have worked in old carriages.

House Decorators.

"In the poorer class of houses it is the habit of these men when they have to redecorate a house to tear away all the old paper which is hanging loosely on the wall, and which they can remove without soaking with water. In this process quantities of dust from the paper are distributed in the air of a room and inhaled" (Annual Report for 1900). If, as in some cases will happen, this is done in a house which has been inhabited by a consumptive who was careless in his habits, the spread of the disease to them can be easily understood.

Case 499. M. 32.—Ill 1 year. Patient is a painter and house decorator. No other history of infection present. (Coates.)

Case 799. M. 42.—Ill 2 to 3 years. Patient was a painter and decorator up to 1½ years ago for 8 to 9 years. No other cause of infection detected. (B.)

Case 1249. M. 35.—Cough 13 years. Failing health 5 months. Patient has been a painter and paperhanger for over 17 years. He often had to strip the paper from the walls of old houses, and found such work very dusty. Except for the fact that a half-brother died of phthisis 19 years ago, there is no evidence of any other possible source of his illness. (B.)

Other Occupations.

Examples may be given of Phthisis occurring in other occupations where the disease has been contracted probably from a workfellow, or where it is probable that the occupation by its character predisposes to Phthisis, but where sufficient cases have not occurred to render a decision on this point possible.

Clerks.

Case 34. M. 27.—Ill 6 months. A clerk in the same office died 6 months ago of phthisis. He used to spit on the floor. (Coates.)

Case 979. M. 25.—Ill 2 years. Several of patients' fellow employés suffer from cough and spit; in particular, one who worked opposite patient "used to turn the others sick by his habit of spitting." Patient states that these patients would spit down the grid covering the hot-water pipes in the office. It appears that many of these clerks were engaged from motives of philanthropy, but their carelessness is likely to turn their office into a breeding place of disease. (B.)

Case 894. M. 37.—Ill 6 years. A great part of patient's work was to go round various offices soliciting orders. While so employed he was often kept waiting in lobbies in company with other men on various errands. He stated there was a good deal of spitting in these lobbies. (B.)

Tailors.

Case 309. M. 48.—Ill about 1 year. Patient remembers several of his workfellows who died of phthisis during the last 4 to 5 years. (The workshop, however, is not implicated in our records.) (Coates.)

Case 410. M. 40.—Ill 5 years. Four years ago he left a workshop where he had worked 5 years. He stated that while working there 3 or 4 men left on account of consumption, 1 leaving just before patient fell ill. (Coates.)

Other cases from this workshop :—

Case 105/99. F. 22.—Ill 4 to 5 years ; here 8 years. Infection said to be due to a workfellow.

Case 325/00. M. 32.—Ill 5 years ; here 5 years ago ; left 2 years ago.

Case 1125/01. M. 39.—Little information available ; here 10 years. Gave work to outworkers.

In case 325/00 another source was discovered, and in case 1125/01 the information obtained was altogether inadequate to settle the source of infection. This leaves only 2 cases, 1 in 1899 and the other in 1901 ; the workshop, therefore, cannot be said to be a centre of infection.

Cook.

Case 692. F. 37.—Ill 8 months. Patient was cook at a restaurant for 6 years. The proprietress, who worked in the kitchen along with her, suffered from cough and spit, and used to spit about the floor. She used to give her old clothes to patient. (B.)

Slater.

Case 753. M. 36.—Ill 8 months. This patient worked for 3 months, and slept 3 times, with an advanced case of phthisis 1½ years ago. (B.)

Stoker.

Case 756. M. 25.—Ill 1 year. He worked along with case 762, who was almost certainly affected first. (B.)

Cotton Spinner.

Case 1061. F. 16.—Ill 1 year. A workfellow next to patient had cough and spit, and had to leave the mill at the same time as patient, but was affected before her. It is stated that this workfellow did not spit on the floor. (B.)

Rubber Workers

In this employment the naphtha used produces odours of which patients loudly complain, but, save in one workshop, there does not seem any connection between the trade and Phthisis.

Case 1395. M. 20.—Ill $1\frac{1}{2}$ years. A workfellow of this patient is at present under treatment at the Consumption Hospital. It is stated that there was no spitting in the workroom. It is to be noted also that patient's brother had died 7 weeks before of hip disease, after several years illness. (B.)

Other cases at this place :—

Case 794/01. M. 25.—Ill 6 months. Waterproof presser. Here 1 year. Left 3 months ago.

Case 1350/01. M. 23.—Little known. A waterproof presser.

Case 1354/01. M. 20.—Ill 4 months. Here 3 years. Macintosh maker. Several workfellows have cough, and spit on floors. Another cause found.

These cases raise a suspicion as to this works, but the place is a large one.

Rag Sorter.

Case 835. F. 58.—Ill 1 year. The rags with which patient worked were of clothes which had been worn. She stated that several of her workfellows suffered from cough and spit, but that she had not worked for any length of time near any particular one of them. (B.)

Case 910. M. 19.—Ill 1 to 2 years. Patient has worked for the last 3 years at a place where rags are dealt with. The workshop is said to be small and badly ventilated. At first he was a labourer there, but later became a stoker, and in this work he had to burn refuse paper as well as coal. He noticed that this, when being brought to him or stirred up with the shovel, produced a great deal of dust. (B.)

House Breaker.

Case 973. M. 30.—Ill 2 months. Patient's work is the pulling down of old houses. The work is extremely dusty, and no doubt many of these houses contain the germs of Phthisis. On the other hand, he stated that all the workmen he knew in this trade seemed healthy. (B,)

Hawker.

Case 842. F. 53.—Ill 4 to 5 years. Many hawkers are on our lists, but there is no clear evidence as to why the trade favours Phthisis. In this case, however, patient hawked old clothes as well as greengrocery. On the other hand, she was very intemperate, and, though she had no favourite public-house, she probably spent much time in public-houses. (B.)

Pawnbroking.

Two cases are on our lists, but in each case a phthisical relative has existed, so that, though the trade is necessarily open to the charge of causing infection, there is no direct evidence of infection by it.

Shudehill Market.

There are 18 cases recorded as having worked here, mainly as porters and labourers. Much spitting goes on in the market, and, whether this is the cause of the disease among these 18 or not, it is disagreeable to find that in a place from which so much of the food consumed in Manchester comes there should be so many possible sources of infection.

Non-pulmonary Tuberculosis.

There is a group of cases in which the disease appears to have been derived from an associate affected by tuberculosis, but the tuberculosis from which the infection arose was not Pulmonary Phthisis, but such cases as tuberculosis of knee, of hip, tubercular glands in the neck, etc. These cases seem to be infectious only when the process is advanced, when the tubercular products have broken down, and discharging sinuses are left.

Case 20. M. 46.—Ill 2 to 3 years. Two of his children have had hip disease, one has recovered, but the other has had the disease 8 years, and sinuses are still discharging. (Coates.)

Case 470. M. 21—Ill 1 year. A brother is suffering from tuberculosis of a hip, shoulder, and some lymphatic glands for 7 years. These are still discharging. (Coates.)

Case 636. M. 41.—Ill 2 years. A child, aged 8, is suffering from psoas abscess. This has been discharging for the last 4 years. (Coates.)

Case 1143. M. 25.—Ill 1 year.—A brother is suffering from hip disease at present. He has been ill 4 years, and has had discharging sinuses for 2 years; he slept in the same bed as the patient up to 3 years ago. (B.)

Case 1395. M. 20.—Ill 1½ years. A brother died of hip disease (inferred from a description of the case) 7 weeks ago. He had been ill about 9 years. (B.)

Unusual Exposure to Infection.

While in most cases the difficulty is to find a source of infection, in some cases it is difficult to decide, among a multiplicity of sources, which is the true one. Examples :—

Case 1035. M. 17.—Ill 2 years. An intimate friend of patient's was, at the date of investigation, in Clayton Hospital, suffering from phthisis. He had been ill 3 years. Patient's fiancée has had cough and spit for the last 3 years. Patient was intimate with her during all this time. A workfellow died 3 years ago of phthisis; he used to spit in a tub where both washed their hands. (B.)

Case 470. M. 21.—Ill 1 year (quoted previously). Brother has had discharging tubercular hip, shoulder, and lymphatic glands for 7 years. Father has had a cough for two years. Bacilli have since been found in father's sputum. (B.)

Case 579. M. 25.—Ill 9 months. A sister is at present suffering from consumption—case 562/00. A companion is getting thin, and suffers occasionally from Pneumonia. Ill 2 to 3 years. (B.)

Case 614. M. 44.—Ill 5 months or more. A case of phthisis has just left a house near patient's home. Ill 12 months or more. Patient was intimate with this case. Patient's sister is at present ill of phthisis. She lives in the same district, and patient often goes to see her. Patient often went to see a man who died next door of phthisis 3 years ago. (B.)

Case 888. F. 29.—Ill 4 years. A sister died of phthisis 3¾ years ago. Another sister died of phthisis 3¼ years ago. Both lived in the same house with patient. (B.)

Case 1049. F. 47.—Ill 1 year. A daughter coughs to some extent, and is emaciating. She had an attack of hæmoptysis 5 years ago. Another daughter who lives next door has suffered from cough for the last 2 years. A son who lives in the neighbourhood is in the first stage of phthisis. Patient's first husband died of phthisis 9 years ago. Patient is a charwoman, and probably washes clothes among her other duties. At one of the houses where she is employed the master of the house has cough and spit, and is thin. (B.)

Certain Diseases of Children.

To what extent certain diseases of children are tubercular and can cause Phthisis in other children or in adults is uncertain. In the following cases it may be guessed that what is called Bronchitis was really Phthisis.

Case 498. M. 10.—Ill 6 months. A brother, aged 1 year, died of Bronchitis 2 years ago. (Coates.)

Case 522. F. 36.—Ill 3 years. Patient has been living at her present address 6 years. Four of her children have died of Bronchitis and wasting: 3 while living at a previous address, the other soon after coming to her present address. Two of them suffered also from diarrhœa. (Coates.)

Case 1345. F. 13.—Ill 2½ years. A brother, aged 4, died of Bronchitis 5 years ago. Ill 3 months. (B.)

In the next group of cases it is not easy to decide. Diarrhœa in children may be due to so many causes besides tuberculosis that it is unsafe to assume that any one of the cases here given was really due to this cause. On the other hand, as in many of the cases no cause for the Phthisis could be discovered, the suspicion is natural that the tubercle bacillus was concerned in at least some of the cases where diarrhœa or "consumption of the bowels" occurred in close relatives. If this be really the case, the habits of young children in poor homes make it easy to understand that the evacuations might sometimes get on the floor and dry there, with the resultant dissemination of tubercle bacilli through the air. In the cases quoted, any other possible source of the disease is alluded to; where this is not given, no other source was discovered.

Case 918. M. 42.—Cough 13 years; seriously affected 6 months. A child died of consumptive bowels 6 years ago, aged 6 months; ill, practically, from birth. (B.)

Case 984. F. 40—Ill 6 months. Husband is case 699/00, and though under observation and frequently warned spits on the floor. A child died of inflammation of the brain 13 years ago, aged 5 years; ill 2 months. A child died of congestion of lungs (after measles) 10 years ago, aged 4½ years, rather suddenly. A child died of consumption of bowels 12 years ago, aged 6 months; ill from birth. A child died from "waste" 7 years ago, aged 13 months; ill from birth. A child died from Meningitis 2 years ago, aged 4½ years; ill 3 weeks. The patient here plainly caught the disease from her husband, but it is not known how he was infected. (B.)

Case 1374. M. 10.—Ill 2 years; weak chest since birth. A brother died of consumption of bowels 3 years ago, aged 5 months; ill from birth. (B.)

Case 466. F. 18½.—Ill 6 months. Brother died 3 years ago of "diarrhœa and waste," aged 1½ years. (Coates.)

Case 521. F. 6.—Ill 1 year. Patient had severe diarrhœa 5 years ago; Measles and Bronchitis 1 year ago. Two younger children had severe diarrhœa, one 4 years ago, the other 2 years ago. (Coates.)

Case 534. F. 39.—Ill 7 months. Patient has had 9 children, of whom 3 are living, the eldest aged 11½, the youngest 8 weeks; of the others, 1 died of consumption of bowels, aged 9 months, in 1893; another died of inflammation of the brain in 1895, aged 20 months; the others died of marasmus, dates not given. (B.)

Case 538. F. 21.—Ill 1 year. Patient is a hooker in a warehouse. Brother died a few weeks ago of consumption of the bowels, aged 6 years; ill two years. (B.)

Case 562. F. 10.—Ill 4 weeks. Sister died of consumptive bowels 6 months ago, aged 4 years; ill 6 months. (B.)

Case 576. M. 15.—Ill 9 months. Brother, aged 4 years, died 4 years ago of consumptive bowels; ill 1 year. (B.)

Case 640. F. 10.—Ill 2 years. A brother (a child) died 1½ years ago of diarrhœa, Bronchitis, and "waste"; another brother, also a child, died of the same 4 years ago. (Coates.)

Case 1456. M. 45.—Ill 2 years. Patient used to spend much time in public-houses. A son died of consumption of the bowels 2 years ago, aged 13 months. (B.)

Case 226. F. 30.—Ill 8 months. A brother died 1½ years ago of Phthisis, patient often saw him. A son has consumption of the bowels at present. (McCleary.)

That a converse process can take place and a child get an illness, not Phthisis, from a phthisical relative seems probable from the following cases, where children died of Meningitis:—

Case 274. M. 40.—Ill 16 months. Patient's baby died 2 months ago of "consumption of the brain" aged 6 months. (McCleary.)

Case 454. F. 41.—Ill 4 months. She seems to have contracted the disease from a consumptive companion. A son died 12 months ago at age 2½ years of inflammation of brain. (B.)

Case 680. F. 7.—Ill 5 to 6 years of spinal caries, Phthisis having developed lately. A sister died of head trouble (presumably tubercular Meningitis) 5 years ago. (B.)

Case 1170. F. 41.—Ill 6 years. A son died of inflammation of the brain and congestion of the lungs 5 years ago, aged 10 months; ill 4 months. (B.)

Summary.

	Cases
History obtained of a probable source of infection …………	467
History obtained of a doubtful source of infection …………	185
Cases in which no source of infection could be traced ………	281
Cases where the diagnosis of phthisis was doubtful …………	16
Cases in which no information was obtained (including cases not investigated, cases from common lodging-houses, houses empty when visit paid, etc.)……………………	392
Cases where the address was incorrect…………………………	41
Cases where the information, owing to the informant's ignorance, was inadequate to give the source of infection………………………………………………	123
	1,505

Sanitary State of Dwellings.

The following is a summary of the condition of the houses visited as regards sanitation. Many of the houses had two or more defects, and are reckoned more than once in the numbers given :—

	Houses.	
Crowded or overcrowded … … … … …	93	
Dirty … … … … … … … … …	240	
Damp in one room at any rate, through, for example, a leaking roof … … … … …	81	
Flags loose or broken in the yard … … … …	103	
Defects in drains—chiefly blocked drains … …	29	
Privy Defects :—		
(*a*) Floor wet or sunk … … … … …	14	
(*b*) Wall or seat broken … … … … …	16	
(*c*) Urine guide defective or absent … … …	62	
(*d*) General condition so bad as to be a nuisance	3	
(*e*) Emptying required … … … … …	6	
Middens … … … … … … … … …	86	
Back-to-back houses … … … … … …	75	
Two-roomed houses, but with through ventilation …	25	(about)
Other defects (various) … … … … … …	11	
No sanitary defects of importance recorded … …	599	
No. of houses … … …	1,201	

Physical Condition of Patients.

As regards the physical condition of the patient, the following information was obtained mainly from relatives :—

Condition "strong" or "good"	334
Condition fairly strong or fairly good	165
Condition narrow-chested, not feeble	162
Condition narrow-chested and feeble	345
Condition feeble but not narrow-chested	53

Work and Workshops.

The patients, in many cases, expressed opinions as to the character of the work and of the workshops in which they were engaged. The results are interesting as indicating the conditions which the patients themselves considered injurious to their lungs :—

1. Workshop :—

(*a*) Stuffy, or badly ventilated	26
(*b*) Small	23

2. Work :—

(*a*) In open air	93
(*b*) Dusty	173
(*c*) Hot	55
(*d*) Giving disagreeable odours..........................	24
(*e*) Damp	12

Dust.

Some cases are classified under more than one heading. An analysis of the cases described as dusty gives the following results :—

Ironworking.—Seems to be especially dusty. This class includes iron-workers not more clearly defined. Iron-turners 5, grinders 4; iron-dressers, iron-borers, 2 each; a slotter, striker, bolt-maker, wire-roller, fitter, 2 planers, a driller, an engine-maker, 2 plate-moulders, a boiler-maker, a file-cutter.

Cotton Weaving or Spinning.—Includes 7 weavers, 2 sorters of raw cotton, 2 drawers-in, 2 piecers, a cardroom hand, a fine spinner, 3 winders, 2 tenters, a worker in a waste works.

Workers in Warehouses.—Of these, 16 complained of the dust. The most interesting is case 938; patient worked in a fent warehouse, where the dust is said to be so great that the girls employed have to cover their mouths. The dust is largely derived from the "size" forced into the fabric. Under this head may be put also 2 cloth-room workers and 1 maker-up of cloth.

Cleaners of Offices.—Shops, workshops, schools, private houses, 11.

Brass Workers.—A clockmaker, a sanitary fitter, an ashpan-maker, two finishers. Under this head may be included case 585. Patient was an engine-man employed at a printing works. A good deal of bronze was used in this works, and the dust of this used to filter down through the floors to the cellar where he worked.

Coal Dust.—Patients exposed to this include 5 stokers, 2 colliers, a coal-yard labourer.

Furriers.—Three patients employed in this trade complained of the dust.

Machinists.—Some of these require separate consideration :—

Case 696. F. 31.—Patient is a handkerchief-hemmer. The work is so dusty as to whiten her dress.

Case 985. F. 26.—A velveteen-worker ; the dust is said to be so great at times as to blacken the teeth.

Case 1028. F. 29.—Makes collars and fronts ; said to be very dusty.

Case 1153. F. 18.—Tailoress ; work described as dusty ; hours long and room badly ventilated.

Case 1400. F. 33.—Cap-maker ; canvass used in stiffening the caps was new, and gave off dust. (C.) Under this head also are a mantle-maker, another cap-maker, and an apron maker.

Fustian Cutters.—Of these there are 5.

Workers in Rubber.—Case 1161. F. 23.—Patient made footballs. In the making French chalk is used in the interior to prevent adhesions. In order that these footballs shall lie closely when packed the air must be extracted, and this is done by sucking.

Case 1463. F. 20.—A balloon-blower. Here also a great deal of chalk is used. This section also includes a garter-maker, a macintosh presser, and an undefined worker in rubber.

Workers in Old Railway Carriages have been previously mentioned. Of these, 2 painters, 2 cleaners, and a breaker-up of carriages complained of the dust.

Workers in Wood.—These include a joiner, a wood-turner, 2 sawyers, a fancy box maker, and an undefined wood-worker.

Clay-pipe Makers.—Of these, two described the business as dusty.

Workers in Stone.—Three stonemasons and a marble polisher.

House Decorators.—Two complained.

Slipper-makers.—Two in this trade described their work as dusty. The trade is of special interest in that it seems to be the custom when riveting the slippers to hold the rivets in the mouth, as a convenient place from which to take them as needed.

Salesmen in Shops.—Dust arises here from the fact that it is the duty of these men in the morning to dust the goods which are to be displayed during the day.

Other Trades which are represented only by single examples are those of a compositor, plasterer, chimney sweep, bag and sheet maker, paper-bag maker, packer of china, lithographic printer (two examples), dyer, velvet dresser, house breaker, loader of ships, glass cutter (2), pawnbroker, carpet beater, etc.

Disagreeable Odours.

In some trades the odours of disagreeable gases are complained of. These cases appear to be neither numerous nor important in Manchester, and even where complained of it does not appear that any injury to the lungs is to be apprehended, though a lowering of the general vitality may be brought about in this way.

The most important cases is that of rubber working; naphtha is freely used, and it is to this that all the complaints relate. In all, complaint was made in 8 cases.

Tailors are sometimes exposed to the fumes from gas-irons, or gas stoves used for warming irons; this occurred specially in two cases; in a third case the patient worked near to a gas engine. One tailor complained of the smell from moleskin.

Cooks are also exposed to the fumes of gas stoves; one made a complaint of it. Various reasons are given in single cases :—

Blacksmith.—Sulphur fumes from burning coal.

Foundryman.—Odours from sand of floor when molten metal was poured into moulds made of it.

Brass Founding.—Fumes from the molten metal.

Tinplate Worker.—In the process of soldering "spirits of salt" is used—fumes of hydrochloric acid.

Boiler Maker.—Burning putty and paint.

Chemical Works.—Various gases.

Painter.—Enamel used has a disagreeable odour, being made partly of animal substances, which are liable to decompose.

Laundress.—One only complained of disagreeable odours from soiled clothes, but it was her business to sort these before washing.

Habits.

In the aetiology of Phthisis the habits of the patients are matters of great importance. In the following list these are given in a general way, so far as they could be ascertained :—

Habits—Good	352	582
Temperate	174	
Total Abstinence	56	
Fairly good or fairly steady		33
Intemperate		301
		916
Not obtained or not recorded		589
		1,505

In this connection it seemed to be worth while to see if any connection could be traced between the habits of the patient and the occurrence of Phthisis. The well-known influence of intemperance in lowering the resisting power of the organism to disease makes the inquiry into its influence on our cases interesting.

Of the 301 cases mentioned above whose habits were intemperate, 58 were rejected because there was little or no other information obtained about the patient. The ages of the remaining 243 were taken, added together, and an average struck, the result being that the average age is 41·3 years.

It was next necessary to determine how this compares with the average age of those whose habits were good, temperate, or who were total abstainers. For this purpose 100 consecutive cases of people of such habits were taken as they occurred between case 600 and case 900, all those whose ages were below 19 being rejected The average age was found to be 33·2, a sufficiently surprising result, as there was a difference of 8 years in favour of the drinkers.

The question then suggested itself, might this result not be due to the fact that those whose habits were good were specially exposed to infection, while those of intemperate habits were not? To answer this question the causes of infection in the 343 cases were analysed, with the following result :—

Causes	Intemperate	Good or Temperate
Probable	79 = 32·5 per cent.	30
Doubtful	52 = 21·5 ,,	29
Not discovered	112 = 46·0 ,,	41
	243 = 100·0 per cent.	100

The figures in the 2 classes are practically identical; indeed, there was slightly more intimate exposure to infection among the intemperate. The reason, therefore, of the 8 years difference does not lie here.

It is possible that the difference is due to the fact that men and women are unlikely to become decidedly intemperate until they approach 30, although they may have occasionally taken drink to excess previously, and that therefore it was not legitimate to commence at so youthful an age as 19 in comparing the classes. It should be noted, however, that cases occur among the intemperate whose ages are given as 24, 25, 23, 19, and that the first 3 of these ages occur more than once.

Isolation.

In the majority of cases information has been obtained as to the character of the isolation (if any) in the patient's home. In most cases the isolation is a negligible quantity, as the patient has occupied the same bedroom, if not the same bed, as other members of the family.

	Cases
No isolation	752
Separate bedroom...	170
Separate room—generally a lodger, who did not associate with the other occupants of the house	37

In 2 cases the patient was found to be the only occupant of the house.

In the remaining cases no information on this head was obtained.

TEMPORARY TREATMENT OF CONSUMPTIVES AT CLAYTON VALE HOSPITAL.

In the prevention of Phthisis no work is more important than that of sanatoria. Not merely is the treatment received by the patients of the greatest benefit to them, but their removal from their homes is of great advantage to their relatives. It is difficult to induce many of the patients under observation to carry out the needful precautions, or at all events to carry them out with the carefulness and exactitude that the importance of the case demands, and therefore even a case under observation must always be looked on with suspicion as a possible source of infection. The advantage of segregating these foci of the disease is therefore obvious. Even though no success should attend the treatment of those in the sanatorium, yet the sanatorium would still justify its existence on this ground.

It is generally believed by the public that the disease can be successfully treated only by leaving the country, or at any rate only in places in the British Islands specially favoured by nature as regards position and climate. But the modern treatment of Phthisis can be carried out anywhere, and though its results are much more striking where the surroundings are entirely favourable, yet even in spots apparently unsuitable surprising results can be obtained.

To secure some definite proof that this is the case it was suggested by the Medical Officer of Health during the year to try the experiment of treating a number of cases of Phthisis at Clayton Vale Isolation Hospital. This hospital is used for the isolation and treatment of cases of Smallpox, but as Manchester had long been free from such cases the hospital was lying vacant.

The situation and character of the hospital is of a kind that would seem to render any success in the experiment almost hopeless. Originally a factory, it stands in the bottom of a valley on the banks of the Medlock, and is frequently buried in the mists which are common there; these facts must be borne in mind in estimating the results attained.

The hospital was opened for the reception of cases of Phthisis on April 26th, 1901, and remained open during the summer. Owing to the occurrence of a case of Smallpox the patients had to be sent home on October 24th. After the departure of this case of Smallpox it was again opened for phthisical patients on November 28th, but these had again to be sent home on January 5th, 1902, for the same reason.

In all, 22 cases were treated. The period of stay in hospital is given in each case. These are as follows:—

Case 240/99. M. 28.—4 months. This patient was first weighed three weeks after admission; was then 6 stone 10 lbs.; increased in a fortnight to 7 stone; remained practically stationary for six weeks; then gradually fell to 6 stone 9¼ lbs. A very severe attack of hæmoptysis occurred, from which he never rallied; he died in the hospital.

Case 711/01. M. 26.—5 months. A very advanced case; he was evidently failing rapidly at the time of admission, fell from 6 stone 13 lbs. to 6 stone 2 lbs. in the first month, and had occasional febrile attacks. His life was almost despaired of at this time. Later his weight began to increase, and shortly before leaving he weighed 7 stone; the febrile attacks had disappeared.

Case 70/01. M. 28.—4 months. An early case, but frequently suffered from hæmoptysis. His weight at entry was 9 stone 1 lb.; in three weeks this increased to 10 stone 1 lb., but then remained stationary about 10 stone for two months. About a month before leaving it began to increase, and stood at 10 stone 5 lbs. when he left.

Case 578/01. M. 24.—2 to 3 weeks. A very advanced case, with attacks of fever; weight diminished slightly during his short stay; he died about 3 weeks after leaving.

Case 274/01. M. 41.—1 month. An advanced case, with tuberculosis of the larynx. Went out against our wish.

Case 471/01. M. 42.—3 months. An early case, but complicated by rheumatism. Weight at entry 8 stone 1 lb., increased slowly, but steadily, to 8 stone 9½ lbs.

Case 200/00. M. 26.—2 weeks. An advanced case, with irregular fever; weight practically stationary.

Case 1035/01. M. 20.—2 months. Weight at entry 8 stone 11½ lbs., increased in about a month to 9 stone 9 lbs., but afterwards fell back to 9 stone 2 lbs. owing to severe indigestion. An early case, complicated with epileptiform fits. Since going out the improvement has been maintained, and he is said now to be in good health.

Case 756/01. M. 25.—3 months. Weight at entry 8 stone 7 lbs., increased in a month to 8 stone 13 lbs.; owing to severe gastritis and hæmoptysis, it fell in 3 weeks to 7 stone 10 lbs.; improved afterwards, and at date of discharge stood at 8 stone 1½ lbs. He was discharged at his own request. An advanced case; he has since died, in January, 1902.

Case 1058/01. F. 23.—1 month. An early case; was developing an attack of pneumonia when admitted, and was confined to bed practically throughout. Weight fell from 6 stone 3¾ lbs. to 6 stone 2 lbs., *i.e.*, remained nearly stationary.

Case 612/00. F. 24.—1 month. A very chronic case of lung disease; existence of phthisis doubtful. Weight 6 stone 2 lbs., increased to 6 stone 5 lbs.; fell later to 6 stone 3½ lbs. She went out without permission.

Case 43/99. M. 31.—1 month. Patient improved in appetite during his stay; he was discharged for disobeying rules.

Case 42/01. F. 19.—4 to 5 months. An advanced case, weight 5 stone 6 lbs., increased to 5 stone 9½ lbs. in 2 months. She then developed inflammation of the pleura and of the kidneys, declined rapidly, and died.

Case 606/00. M. 20.—6 months. A very chronic case; weight at entry 7 stone 11½ lbs., increased to 8 stone in a fortnight, remained about 8 stone for 3 months, and then gradually increased to 8 stone 3½ lbs. He left the hospital then, and was out for about 2 months; on re-admission, his weight was 7 stone 13 lbs., and this increased to 8 stone 2 lbs.; he was in the hospital on this occasion 3 weeks.

Case 1250/00. F. 20.—6 months. An advanced case; weight at entry 5 stone 9 lbs., increased to 6 stone in a month; increased gradually in another month to 6 stone 2 lbs.; was stationary for 2 months, then rose to 6 stone 3 lbs.; and at date of discharge was 6 stone 2 lbs. She was out of the hospital for 6 weeks; on re-admission, weighed 5 stone 4¼ lbs.; and she died in 3 weeks.

Case 123/01. M. 46.—11 days. Patient was intemperate, and left because he was not allowed stimulants.

The remaining cases were admitted after the hospital was re-opened in November; the longest stay of any case was, therefore, only 5 to 6 weeks.

Case 460/01. F. 37.—5 to 6 weeks. A fairly early case, greatly troubled with dyspeptic symptoms; weight at entry, 8 stone 2lbs.; increased in 3 weeks to 8 stone 4¼ lbs.; later fell to 8 stone 3 lbs.

Case 1465/01. F. 22.—3 weeks. An advanced case, with high temperature on admission; weight fell throughout, from 6 stone 7½ lbs. to 6 stone 3¾ lbs.

Case 1415/01. M. 21.—1 month. A very chronic case; weight at entry 6 stone 11½ lbs., increased before leaving to 7 stone 4 lbs.

Case 1400/01. M. 43.—5 weeks. A chronic case of lung disease, probably not phthisis; weight at entry 9 stone, increased to 10 stone 4¾ lbs.

Case 978/01. F. 23.—5 to 6 weeks. An advanced case, with irregular fever at first. Weight at entry 7 stone; fell during the first three days to 6 stone 13½ lbs.; increased in a fortnight to 7 stone 4½ lbs.; at date of discharge 7 stone 3 lbs.

Case 1203/01. M. 23.—3 days. A very chronic case; discharged with the others on January 5th, 1902.

SUMMARY.

Deaths 3.—Case 240/99. No improvement.
Case 42/01. At first improvement.
Case 1250/00. Improved at first 8 lbs; while outside hospital fell off 14 lbs. in 6 weeks.

Improved 8.—Case 711/01. After primary fall improved 12 lbs.
Case 70/01. Improvement 18 lbs.
Case 471/01. Improvement $8\frac{1}{2}$ lbs.
Case 1035/01. Improvement $11\frac{1}{2}$ lbs.; later a fall; ultimate improvement $4\frac{1}{2}$ lbs.
Case 606/00. Improvement 6 lbs.
Case 1415/00. Improvement $6\frac{1}{2}$ lbs.
Case 1400/01. Improvement $18\frac{3}{4}$ lbs.
Case 978/01. Improvement $4\frac{1}{2}$ lbs.

Unchanged 7.—Cases 578/01, 200/01, 1058/01, 612/00, 43/99, 460/01, 274/01.

Of the seven unchanged cases, *all* were in the hospital under six weeks.

Worse 2.—Case. 756/01. Improved at first 6 lbs., then rapid fall of 11 lbs.; later improved; ultimate loss $5\frac{1}{2}$ lbs.
Case 1465/01. Lost 4 lbs. In hospital only 3 weeks.

In hospital a very short period :—
Case 123/01. For 11 days.
Case 1203/01. For 3 days.

Cases.	Improved.	Unchanged.	Worse.	Died.	Total.
Early	3	2	—	—	5
Advanced	5	5	2	3	15
				Total.....................	20

Two cases were in for a very short period, both being advanced cases.

When it is remembered that cases rapidly get worse in the crowded homes of the poor, it becomes clear how encouraging the above results are.

In conclusion, I beg to state that Dr. Cowie has rendered me considerable assistance in preparing this report.

JAMES BEATTY.

TUBERCULOSIS AND MILK.

WORK DONE BY THE VETERINARY SURGEON FOR THE SANITARY COMMITTEE FROM MAY 1ST TO DECEMBER 31ST, 1901.

I beg to submit my report for the last eight months of the year 1901; the previous four months, ending April 30th, have been included in the report submitted by Mr. Lloyd for 1900.

Since my appointment my time has been fully taken up—(1) In inspecting the Manchester Cowsheds and Dairies as to their compliance with the Manchester Regulations made under the Dairies, Cowsheds, and Milkshops Orders; (2) in carrying out the duties of Veterinary Inspector in the working of the Milk Clauses contained in the Manchester General Powers Act, 1899.

The latter duties comprise the inspection of the cows in the City cowsheds for tuberculosis of the udder, and also of the cows upon farms outside Manchester from which tuberculous milk has been sent into the City.

Manchester Cowsheds.

In carrying out the systematic inspection of farms under the Manchester Regulations, 139 visits have been paid and 272 cowsheds inspected.

On the whole, the effort made to reach a high standard of cleanliness is meeting with a fair amount of success, and in the great majority of cases the cow-keepers are doing their best to keep their cattle and premises clean.

In a few cases it has been my duty to warn them that additional attention to the cleanliness of the cowsheds is necessary.

In these cases the farmers are also written to by the Medical Officer of Health, and this usually brings about a better state of things.

Although in many of the cowsheds there is a smooth surface of cement to a height of three or four feet from the floor, it has occasionally to be pointed out to them that this smooth surface is provided so that it may be easily cleansed.

In most of these cases, however, I am of opinion that this want of strict attention to the cleanliness of the walls is more the result of thoughtlessness than of wilful negligence, as, in every case where a second visit has been paid after a warning, a very considerable improvement is noticeable.

I have endeavoured to point out to the farmers the necessity for more frequent whitewashing, but they are difficult to move in this direction, and for the most part still adhere to their old custom of whitewashing twice a year—in the spring and autumn.

They appear to think (perhaps conveniently) that it is impossible to whitewash a cowshed when the cows are in.

With regard to the improvement of the sanitary conditions of the cowsheds steady progress is being made, but this work is of necessity slow, and a considerable number yet remain to be dealt with.

The faults chiefly noticed are insufficient cubic contents and superficial space per cow, deficient ventilation and light, and bad drainage.

In addition to the main defect mentioned above, very few farms are provided with a properly constructed middenstead, and very often the yard is in a bad state.

It may not be out of place to point out the method of procedure in these cases.

The farm is visited by the Veterinary Surgeon and Inspector Hyslop, and the building, etc., measured.

Where reconstruction to comply with the regulations is possible, a plan and specification are prepared for the assistance of the farmer, but they are of course at liberty to alter and reconstruct as they please, to comply with the Regulations.

As far as possible, in new or reconstructed cowsheds, a good supply of town's water has to be provided, and the stalls are single instead of double, the cows being separated by a partition of sufficient height to prevent them licking one another.

Earthenware feeding troughs, with smooth glazed surface, are also asked for, to replace the wooden tubs which are commonly used in the City.

Alterations to comply with the Regulations.

The following is an abstract of a report prepared and presented by the Medical Officer of Health to the Hospitals Sub-Committee on October 2nd, 1901 :—

He states that since these measures were entered upon in 1895, for each farm dealt with a specification is prepared, and a copy of the regulations has been sent to each cow-keeper, showing the particulars in which the farm has failed to comply with the regulations.

In the result, a number of farms have been closed, and others have been greatly improved. The position on October 2nd may be summed up as follows :—

Twenty-two farms have been closed, and one is about to be. Another should be under notice at Xmas, 1901.

In eight instances specifications have been sent out, and have either entirely or practically entirely been carried out.

At three farms the greater part of the necessary work has been done.

At one farm part of the required work has been done, and the farmer states that it is his intention to use only the altered cowshed during the ensuing winter.

Specifications have been sent to eight other farms, but, so far, nothing or next to nothing has been done.

With regard to six farms that have also been taken in hand, no specifications have been sent.

Since this report was presented, the following work has been done :—

The alterations to comply with the regulations have been completed at one farm, at two others the work is in progress, and three have been closed.

Of the remainder to whom specifications were sent, and nothing done, three have given guarantees to carry out the requisite alterations as soon as the weather permits, and one has undertaken to vaćate his farm by May, 1903.

One of the cow-keepers has been summoned for non-compliance with the regulations, but the summons has been adjourned to allow the necessary alterations to be made.

One cow-keeper was found who had not registered as such. No proceedings were taken. He was requested by the Veterinary Surgeon to register at once, which he did.

Manchester Cows.

During the last eight months of the year, 1,839 cows were examined in the City cowsheds. This implies that a considerable number of the cows have been examined more than once.

It is difficult to estimate the exact number of cows kept in the Manchester cowsheds, as at different seasons the numbers vary, most cowkeepers keeping more in the summer than in the winter. This is particularly seen after a bad hay harvest—when fodder is likely to be dear.

On the whole, the milking-cows in Manchester are an excellent lot, and would compare very favourably with cows in any other part of the country. They are usually in the best of condition—this being explained by the fact that as soon as a cow is dry (or at least very soon after) she goes to the butcher. The dairymen like to clear them off as soon as possible, so that they are as a rule liberally fed.

The majority of the Manchester cows are kept clean. As a rule, drawing the cow-keeper's attention to the state of the cows has been sufficient for a time, and at the succeeding visit great improvement has been noticeable. In improperly constructed cowsheds cleanliness entails considerable labour. The very small amount of bedding used is also an important factor, and were this increased and the cows given a good clean bed of straw, or some other suitable litter, the cows would be easier kept clean. In the great majority of farms nothing but sawdust is used.

No doubt after a cowshed has been cleaned out and sprinkled liberally with sawdust it looks very nice, but, as bedding, sawdust is a failure, my chief objection to its use being that, instead of the farmers collecting it and removing it with the excreta, they sweep it into the urine channel and from thence into the drains, the result being that it is not very long before the drains are blocked.

One cow suffering from tuberculosis of the udder was found in one of the City cowsheds, and in one instance the owner was advised to have a cow slaughtered which was suffering from advanced tuberculosis. The second cow was slaughtered at the Manchester Abattoirs, in the presence of Mr. Holburn, M.R.C.V.S., Chief Meat Inspector, and the carcase was condemned by him as unfit for human consumption.

The farms on the Blackley, Crumpsall, and part of the Moston districts are favourably situated in respect of grass land, there being, generally, good crops of grass. In the southern district the grass is fairly plentiful, but the ground in parts is low-lying, and for the most part the pastures are damp.

With regard to the other districts, particularly Newton, Clayton, and part of Moston, the farms have grazing land attached, but the herbage is extremely scanty.

After the cows have once been housed for the winter months, it is rarely that they go out again until spring, although, in most cases, they are let out for a few minutes night and morning for water. It would be better if the farmers took more advantage of occasional fine days, and let their cows out for exercise for an hour or two in the warmer parts of the day.

This would allow the cows to get a certain amount of fresh air, and also would allow the air in the cowsheds to become purified for a short time.

Manchester Milk Clauses.

These clauses are embodied in the Manchester General Powers Act, 1899, and have already been given in detail, and a brief summary is all that is necessary.

The same methods of procedure under the clauses have been continued during the year as were set out in the last two Annual Reports, and are briefly as follows:—Samples of the milk supplied to Manchester by rail or road conveyance are taken at the Manchester railway stations, or elsewhere, by the Food and Drugs Inspectors. These are submitted to Professor Delépine for bacteriological examination. All samples reported by him as having been found to cause tuberculosis are followed up to the farm by the Veterinary Surgeon, accompanied by the representative of the Medical Officer of Health.

The Veterinary Surgeon examines all the milking cows on the farm, and takes special samples from all cows having diseased or suspicious udders. The special samples are taken in sterilised vessels provided by Professor Delépine with every care to avoid any extraneous infection. These samples are also submitted to Professor Delépine for examination, and in this way the fact of a particular cow having a tuberculous udder is definitely proved. Samples from cows found to have suspicious or diseased udders by clinical examination, without previous station samples, are examined in the same way.

Tuberculous Milk.

As a result of the inspection of 1,839 cows in the Manchester cowsheds, only one was found suffering from tuberculosis of the udder. This cow was slaughtered at the Water Street Abattoirs, and the carcase, being badly affected, was condemned as unfit for human consumption by Mr. Holburn.

Four hundred and twenty-eight cows were inspected at country farms in connection with the milk supply to Monsall and Clayton Vale Hospitals; of this number, one cow was proved to be suffering from tuberculosis of the udder. The owner elected to fatten the cow, which did very well for a time, but when it was slaughtered, as it was in my presence, I found the carcase very extensively diseased, and quite unfit for human food. It was buried.

During the year 310 samples have been taken at the Manchester stations from the milk cans belonging to 272 farmers. Of these farmers, 172 reside in Cheshire, and 18 of them (10·46 per cent.) sent tuberculous milk; 65 live in Derbyshire, and 6 of them (9·23 per cent.) sent tuberculous milk; 25 live in Staffordshire, and two of them (8 per cent.) sent tuberculous milk; 10 of them live in Shropshire, and one of them (10 per cent.) sent tuberculous milk.

It will thus be seen that of the milk sent by rail to Manchester from 272 farms, the milk from which was examined by Professor Delépine, that from 27 of them (9·92 per cent.) was tuberculous.

It will also be apparent that the milk from several of the farms has been examined more than once.

From returns supplied by the farmers themselves to the Public Health Office, the estimated number of cows at these 272 farms is 5,366 (equal to just over 19 cows per farm), and in following up the 27 tuberculous station samples the udders of 1,013 cows have been examined.

Of these latter, the number proved to have tuberculous udders is 14, while at 14 of the farms no cows with tuberculous udders were found. It will be seen that on less than half of the farms was the source of infection discovered.

Every care is used to be sure that the affected animal or animals have not been overlooked by taking control samples, and in every one of the cases where no diseased cow was found the control sample proved negative, showing that it is highly probable that the diseased animal has been got rid of previous to the visit of the veterinary surgeon; in some cases it is possible to obtain information to the effect that a cow was sold a week or two previously, but the farmer usually pleads ignorance when questioned as to the condition of the udder in the cow which has been sold.

The advantage of the control sample was well shown in two cases. In one case (case 67), at the first visit I was unable to discover the affected animal. The control sample proving infective, the farm was again visited, and on this occasion the cow was discovered, though the udder was then only very slightly affected. In the other case, on the first two occasions that the farm was visited, 7 special samples in all were taken, and also a control sample at each visit. On both occasions all the special samples were negative, but the result of the control samples was positive. The farm was again visited a third time, and on this occasion I divided the cows into groups of six, and took the samples so as to include every cow. Each sample was in fact a control from every six cows. On this occasion all the results were negative. I may say that at the first visit I found a cow with induration of the udder, clinically a fairly well marked case of tuberculosis, on the second visit the induration had increased, the quarter was becoming hypertrophied, and the cow was losing condition. On both occasions special samples were taken, but both proved negative.

In the interval between the second and third visit the cow was sold, and the control samples taken at the third visit proved negative. If one entertains the idea that this may have been the undiscovered cow, one must also admit that the cow had been milked in a different manner for the single samples and for the control specimens.

The cows proved to have tuberculous udders were disposed of as follows:— Eight were slaughtered in the presence of the Veterinary Surgeon, and the carcases of six of these were condemned as unfit for food. Of the remaining two, in one case, the carcase, being well nourished and but slightly affected with tuberculosis, was passed; in the last case, there being no disease in the fore-quarters, these were passed as fit for food.

Two cows are being fed, and one of the owners has promised to notify time and place of slaughter, so that the Veterinary Surgeon may attend. The other farmer states that the cow has been isolated, but that as she is in calf he will give no promise to notify slaughter.

Four have been removed by the owners, and their ultimate disposal could not be ascertained. In two cases, however, the owners stated that their cows had been sold for slaughter to butchers, while in the other two cases the farmers stated that they had sold the cows to unknown dealers.

One farmer has been prosecuted under the Manchester Milk Clauses. This was for having failed to give written notice to the Medical Officer of Health for Manchester of the presence on his farm of a cow having well-marked tuberculosis of the udder. The case was tried at the City Police Court, and a fine of forty shillings, and three guineas special costs, imposed.

Appended are particulars of the disposal of all Cows found suffering from Tuberculosis of the Udder between May 1st and December 31st, 1901; some of the cases were investigated by Mr. Lloyd, M.R.C.V.S.

Case 57.—This cow was discovered on June 5th, when the farm was visited in following up an infected station sample. The owner was written to by the Medical Officer of Health, and letters were also sent to the District and County Medical Officers of Health. In reply, a letter was received from the owner, saying, "the cow was sold a week or two ago." A letter was also received from Dr. Vacher, stating that the cow had been sold to a butcher before the report was received.

Case 59.—This cow was found on April 23rd in following up a previous infected station sample. On June 6th the Veterinary Surgeon again visited the farm, and found the cows isolated. The owner promised to make arrangements for slaughter, so that the Veterinary Surgeon might attend, and that he would notify the Medical Officer of Health. Nothing further was heard from the farmer, so the Medical Officer of Health wrote on September 10th asking what he proposed to do. A reply was received to the effect that one cow had been sent to the bone mill, and the other sold. A further letter was written by the Medical Officer of Health asking for the address of the bone mill, and also the address of the purchaser of the second cow. The farmer wrote naming the Harrington Bone Works, near Macclesfield, and also stated that the cattle-dealer who bought the second cow was a stranger to him.

Case 60.—This cow was also found in following up a previous infective station sample. On the day following the visit of the Veterinary Surgeon, a letter was received from the farmer stating that the cow's milk would be kept back from sale, and if it proved to be tuberculous he was willing to have the cow slaughtered at the farm in the presence of the Veterinary Surgeon.

The Medical Officer of Health wrote saying that the arrangements made were satisfactory, but that the dirty condition of the cowshed and premises was most unsatisfactory. At the same time a copy of this letter was also sent to Dr. Barwise, County Medical Officer of Health.

By return of post a reply was received from the farmer stating that he had noted the gravity of the Medical Officer's letter, and offered to visit Manchester and talk matters over with the Medical Officer of Health. On May 3rd the Veterinary Surgeon again visited the farm, and measured the shed, etc.

The final report was received on May 17th, when the Medical Officer of Health wrote to the farmer stating that the milk had been found to cause tuberculosis. The farmer called at the Town Hall three days later, and stated that he had made arrangements to slaughter the cow on May 23rd, on which date the Veterinary Surgeon attended and witnessed slaughter. He found that the carcase was thin and badly nourished, and although there were only a few tuberculous lesions, it was pronounced unfit for food.

Case 61.—This diseased cow was found on April 25th, a previous station sample having been reported as causing tuberculosis. On May 9th the Medical Officer of Health wrote to the owner, and also to Dr. Vacher and Dr. Nall.

A reply was received from the farmer saying that the cow had been isolated and was being dried off, also that he would make arrangements for slaughter as soon as he could, and again advise the Medical Officer of Health.

On May 10th, a letter was received saying that arrangements had been made to slaughter the cow on the following day at the City Abattoirs.

The carcase was examined by Mr. Holburn, and found to be badly diseased. The whole carcase was condemned.

Case 62.—This cow was found by the Veterinary Surgeon on April 19th, and his diagnosis was afterwards confirmed by Professor Delépine. On May 22nd the Veterinary Surgeon again visited the cowshed, when he found that the farmer had gone, and, although every attempt was made to ascertain his whereabouts, he was not found, so that the ultimate disposal of the cow is not known.

Case 63.—This cow was found in following up a previous station sample which Professor Delépine had certified as capable of causing tuberculosis.

The farmer was written to by the Medical Officer of Health, who also wrote to Drs. Vacher and Davidson. On July 2nd a letter was received from the farmer, saying that the cow would be fattened, and that when she was sold for slaughter he would notify the Medical Officer of Health. Dr. Davidson also wrote, saying that he had visited the farm and found the cow isolated, and that the farmer intended feeding her.

On August 5th a postcard was received from Mr. J. L. Wood, Harrington Bone Works, Macclesfield, saying that the cow had been slaughtered on August 3rd.

Case 64.—A sample of milk taken at the railway station having been reported by Professor Delépine as having caused tuberculosis, the farm was visited by the Veterinary Surgeon, when he found a cow with symptoms suspicious of tuberculosis of the udder. A sample of milk was submitted for bacteriological examination, in which Professor Delépine reported that tubercle bacilli had been found.

The Medical Officer of Health wrote to the farmer, and to Drs. Vacher and Rushton, and three days later a letter was received from the Surveyor to the Macclesfield Rural District Council saying that the cow would be slaughtered on July 10th.

A post card to the same effect was also received from the farmer.

The Veterinary Surgeon attended, and witnessed the slaughter of the cow. The carcase was much wasted, and there was considerable old standing tubercular disease. The whole carcase was entirely unfit for human food.

In addition to the tubercular lesions, it was also found that the cow had suffered from traumatic pericarditis, produced by the passage of a piece of wire from the reticulum (second stomach) through the diaphragm to the pericardium. The pericardium was about three inches thick, and contained at least a gallon of fœtid purulent fluid. The pericardium had also become tuberculous, though the disease was far more recent than elsewhere.

Case 65.—This cow was found in following up a previous infected station sample. When the Veterinary Surgeon asked the farmer if he had not noticed the condition of this cow's udder, he stated that he had done so for about a fortnight, as she had caught cold through standing opposite the door.

On July 18th the Medical Officer of Health wrote to the farmer, and also to Dr. Vacher and Dr. Somerville.

No reply was received from the farmer, but Dr. Somerville wrote saying he had called at the farm, and had been informed that the cow was sold at Macclesfield, but the farmer did not know who had bought her.

The case was laid before the Hospitals Sub-Committee, who referred the matter to the Town Clerk for prosecution on the ground of failure to notify. The case was heard at the City Police Court, and a fine of forty shillings and three guineas extra costs, imposed.

Case 66.—This cow was found by the Veterinary Surgeon when visiting in connection with the milk supply to Monsall Hospital.

On July 9th the Medical Officer of Health wrote to the farmer, and also to the Medical Officer of Health for the County and District. The following day a telegram was received, asking for the identification of the cow.

On the 22nd the farmer called, and had an interview with the Chairman of the Hospitals Sub-Committee and the Medical Officer of Health.

Later the Medical Officer of Health again wrote to the farmer, asking what he proposed doing, urging slaughter of the cow, as feeding would most probably be waste, and also requesting him to notify the time and place of slaughter, so that the Veterinary Surgeon might attend.

A reply was received, saying that he had removed the cow from his milking herd to a neighbouring farm, and would try and feed her along with some store cattle, but would notify the place of slaughter.

At the end of August the farm was again visited by the Veterinary Surgeon, and the cow appeared to be feeding well, but the condition of the udder was worse. On October 16th the farmer telegraphed to the Veterinary Surgeon that he had made arrangements to have the cow slaughtered next day; the Veterinary Surgeon submitted the telegram to the Medical Officer of Health, who wrote to the farmer. The Veterinary Surgeon attended as arranged, the animal being slaughtered at a farm eight miles distant by a cattle dealer who had purchased her.

The carcase was fairly well nourished and of good colour, but the tubercular lesions were very extensive, and the whole carcase was condemned as unfit for food.

Case 67.—On August the 14th the farm was visited by the Veterinary Surgeon, a previous station sample having been proved to be tuberculous The cows werecarefully examined both before and after milking, but no cow could be found with any symptoms of tuberculosis of the udde

A control sample was taken, and was reported on September 23rd as being capable of causing tuberculosis.

The farm was again visited, and this time the cow was found, though the lesions of the disease were only extremely slight. Still, they had developed sufficiently to point to the udder as being suspicious.

On October 27th the Medical Officer of Health wrote to the farmer, and also to Drs. Vacher and Cawley.

The farmer was again written to by the Medical Officer of Health, asking when the cow was to be slaughtered. In reply, the farmer wrote saying that the cow had been fattened and sold for slaughter before the Medical Officer of Health's first letter was received.

The Medical Officer of Health replied that he would have been better satisfied had the cow been slaughterd under the inspection of the Veterinary Surgeon, but under the circumstances he did not intend to take further action.

Case 68.—This cow was found by the Veterinary Surgeon when following up a previous infective station sample.

The Medical Officer of Health wrote to the farmer and Dr. Vacher, and the latter also communicated with the Medical Officer of Health for the District.

On September 8th the farmer wrote that the cow would be slaughtered on the following day.

The Veterinary Surgeon attended and witnessed slaughter. The cow had apparently fed well, and the carcase presented a well-nourished appearance, but the amount of tuberculosis present in both cavities prevented any other decision than condemnation of the whole carcase as unfit for food.

Case 70.—This cow was found in a similar manner to the last, the station sample having proved tuberculous. On October 10th the Medical Officer of Health wrote to the farmer and to Dr. Barwise and Dr. Potter. A few days later a reply was received from the farmer stating that the cow had been dried off and was being fattened for slaughter.

On January 9th the farmer was again written to by the Medical Officer of Health asking for date of slaughter, when he replied that the cow was not yet ready for slaughter, and that he had discontinued sending milk to Manchester.

On the following day copies of the correspondence were sent to Dr. Barwise and Dr. Potter.

Case 72.—This cow was found in following up a previous infected station sample. The farmer intimated to the Veterinary Surgeon that he would have the cow killed within a day or two.

On September 23rd a letter was received from the farmer saying that the cow would be slaughtered next day.

The Veterinary Surgeon attended and witnessed slaughter, and found the carcase fairly well nourished, the tubercular lesions being confined to the udder and the abdominal cavity. The hind-quarters were condemned and the fore-quarters passed as fit for food.

Case 75.—This cow was found in following up a previous infected station sample.

On November 8th the Medical Officer of Health wrote to the farmer and to Dr. Vacher and Dr. Bennett.

A reply was received from the farmer saying that the cow was isolated and being fed for slaughter, and that he would notify in the course of a week or so his further intentions. The Medical Officer of Health wrote at once asking for a definite statement.

In answer to the last letter, the farmer replied that he was sending the cow to A—— B—— (naming a butcher) to be slaughtered on the following day.

The Veterinary Surgeon attended and witnessed slaughter of the above cow, and found that the carcase was well nourished, there being only a very slight amount of tuberculosis present, and this confined to one or two mesenteric glands. The carcase was passed as fit for human food after removal of the affected parts.

Mr. Sadler, Secretary to the Cheshire Milk Producers Association was also present at the post-mortem.

Case 77.—This cow was found by the Veterinary Surgeon, and his diagnosis was afterwards confirmed by Professor Delépine.

On receipt of Professor Delépine's report the Veterinary Surgeon visited and informed the farmer that the cow had been proved to be suffering from tuberculosis of the udder; three days later the farmer called at the Town Hall to notify that the cow would be slaughtered at the Manchester Abattoirs on the following day.

The cow was slaughtered in the presence of Mr. Holburn, M.R.C.V.S., Chief Meat Inspector, and the Veterinary Surgeon. The carcase was found to be fairly well nourished, but the tubercular lesions were very extensive, and the whole carcase was condemned.

Case 79.—This cow was found in following up a previous infected station sample. Three days after the Veterinary Surgeon's visit to the farm the farmer wrote to him, saying he was quite unaware that anything was wrong with the cows, and he was greatly surprised that the milk should have been found to be tuberculous; in addition, it was not long since his cattle had been tested by Professor MacFadyean, whose results were very favourable.

On December 10th the Medical Officer of Health wrote to the farmer and to Drs. Porter and MacQueen.

A week later the farmer wrote that he could not see his way to slaughter the cow, as she was in calf, but that he had isolated her.

The Medical Officer of Health replied that he did not ask for immediate slaughter, but he wanted a guarantee that when the farmer made up his mind to slaughter the animal he would notify time and place to the Medical Officer of Health, so that the Veterinary Surgeon might be present.

The Medical Officer further pointed out that the milk from the cow was dangerous to other animals, more especially as there was a fairly large tubercular abscess in the affected quarter.

The farmer replied that doubtless the Medical Officer of Health's advice was good, but that farmers could not afford such a loss, especially during such a period of agricultural depression.

The Medical Officer of Health again wrote, urging the farmer to consent to slaughter, but in reply received a letter from the farmer saying that he would repeat his former promise not to send milk from this cow to Manchester, nor allow her to come in contact with any other cows from whom milk was being sent to the City ; that he had not yet made up his mind what he would do with her, but at any rate intended keeping her until she had calved, when he would try to feed both her and the calf—more as an experiment than anything. He concluded by saying that he would write again before he sold her, but so far nothing has been heard from him.

The Country Cows and Cowsheds.

It has been mentioned that altogether a total of 1,441 cows have been examined at the country farms, and that of this number 428 were examined in connection with the milk supply to Monsall Hospital.

By far the greater number of cows used for dairy purposes are shorthorns ; cows of other breeds were also seen, but not in any considerable numbers ; and for general all-round utility, whether for cheese, butter, or milk, the consensus of opinion is undoubtedly in favour of the shorthorn as a dairy cow. This statement is not based on impression alone, or by the mere fact of the preponderance in number of cows of the breed in the herds, but is the result of personal inquiry amongst farmers generally.

Here I might draw attention to a fact which was noticeable at a number of farms, viz., the small proportion of cows at their prime as dairy cows, that is to say, cows which have had 3, 4, or 5 calves ; instead, I found the cows were either very old or very young. For instance, at one farm visited I examined 14 cows, and of this number 5 were very old, not one of them less than ten years of age—the oldest was at least 17. Of the remaining 9, 7 had only had one calf, and the other two had had two calves apiece.

In my opinion, this is indicative of a want of ready money, as no sooner has a cow arrived at the time of greatest produce than she is sold.

Cleanliness.

Of the 1,441 cows examined, I have described 376 as being dirty, giving 26·09 per cent.

Under this heading I have only included those cows which are really very dirty, and do not include any that might be described as rather dirty, or moderately clean, etc.

Nearly always bad cowsheds and dirty cows are found together, though occasionally this does not hold good, but, as a general rule, where you find bad insanitary cowsheds you find dirty cows. When I speak of dirty cows, I mean not only those with dirty quarters and tails, but those in which the udders are also dirty. In fact at one farm (case 80) a really abominable state of filth was seen.

Under these conditions, as will be readily understood, it is occasionally extremely difficult to make anything like a proper examination of the cow's udder. So effectually plastered up with dung and dirt do we find some udders that the dirt effectually masks any slight abnormality, such as commencing induration.

When the farmers are remonstrated with, the same replies are almost always received, namely—(1) scarcity of labour; (2) scarcity of bedding; (3) and want of time. The first and last are practically synonymous, but I have separated them advisedly.

The first two excuses are undoubtedly genuine ones, but the latter is often, in my opinion, a little far-fetched.

It is, of course, a fact that the serious necessity for cleanliness of the cattle is not sufficiently impressed on the farmer, and it is also very difficult to eradicate the old belief that dirt keeps the cattle warm, and is healthy.

Sometimes when I have asked farmers why they did not clean the dirt off the hind-quarters and udder of a cow they have intimated that this was a dangerous proceeding, and could not be done until the warm weather came.

In examining these 1441 cows, the number of cows found with some diseased condition of the udder was 67, giving an average of 4·65 per cent., and of these the number proved to be tuberculous was 15, equal to 1·04 per cent.

With regard to the cows examined for the milk supply to Monsall and Clayton Vale Hospitals, the procedure is practically the same as in the examination of cows in following up a tuberculous station sample.

Country Farms.

Altogether, during the last eight months of the year 1901, 34 country farms have been visited, and of this number 27 were visited when following up tuberculous station samples.

When visiting in connection with a tuberculous station sample it is necessary for the Medical Officer of Health, or his representative, who bears his authority in writing, accompanied by a Veterinary Surgeon, to obtain a magistrate's order from a Justice of the Peace having jurisdiction in the place where the farm is situated.

The buildings are inspected as to their sanitary condition. They are also measured, and, in a book kept for the purpose, I have a ground plan drawn to scale of every farm visited, so that the cubic contents of a building can be estimated at any time.

The position of each cow at the time of my examination is also marked on the plan, so that it is also valuable for purposes of identification if occasion arises; this latter is, of course, only a supplementary means of identification, as a full description of the cow is also taken.

At 10 of the farms visited the premises are described as dirty: this excludes cowsheds, which are treated separately, and merely refers to the condition of the premises generally, more especially from an external point of view.

Very few of the farms have any approach to a properly constructed middenstead—in fact, out of all the farms visited, I only saw one at which there was a properly constructed receptacle for the excreta.

At 6 of the farms the middenstead is described as fair. Under this heading I include those which have some semblance to construction, but these also are, of course, but little removed from being as unsatisfactory as the ones which are termed bad.

At one farm the middenstead was of a particularly bad character. There had originally been a wall on three sides, the third wall being formed by the external wall of one of the cowsheds, in which stood eight cows. At the time of my visit the liquid was percolating in considerable quantity into the cowshed, in which there was no drainage. (Case 71.)

The water supply at a good many of the farms is very often of a questionable quality; as a rule, most farms are provided with a pump-well for the house, and the cattle drink at either a pond or streams running through the pastures.

With regard to the well water, so far as one can judge by ordinary examination, it is for the most part good.

I have, however, had reason in two cases, after examination of the source of the supply, to strongly suspect contamination.

In one case particularly, the farm was situated on a hillside, the well from which the supply to the house was derived was situated about fifty yards above the house, in the centre of the junction of three roads, and just above the well was a public-house, which had two midden closets; in addition to this, the cover of the well was defective, and would undoubtedly admit road washings.

The total number of cowsheds inspected is 111, and the greater number of these are of the most insanitary character.

Of this number, 48 were found to be dirty. As a matter of fact, only an infinitesimal number were found clean, if we adhere strictly to the meaning of the word, but I am afraid when dealing with cowsheds the word has to be used with a considerable amount of elasticity.

This great want of cleanliness is hardly to be wondered at when we consider the structural conditions of the majority of the country cowsheds.

It is rare to find a cowshed which can be termed satisfactory, that is to say, one in which there is sufficient cubic space, a sufficiency of light and ventilation, and a good system of drainage.

Of the total number of cowsheds examined, the number found in which there was an insufficiency of light was 73, equal to 66·6 per cent.

In a large number of cowsheds the only means of lighting at all is the door, and this, of course, is always kept closed; and even in those cowsheds where there is a window, it is usually the case that the glass has been broken, and the opening is either filled up with hay or straw, or a piece of canvas nailed over.

Ventilation is very deficient in 68 of the cowsheds (61·26 per cent.) In a considerable portion of the remaining 43 it is not altogether satisfactory.

The value of ventilation is, in my opinion, the most difficult part of sanitary reform to impress upon the farmer. They are of opinion that the unnatural state of heat which is found in an overcrowded cowshed is the best condition in which to keep a dairy cow.

In fact, as one farmer expressed himself to me, they liked to see a nice dew on the cow. It is not uncommon to find the cows covered with moisture.

The remarks I have already made with regard to the stopping up of openings to exclude light are equally applicable with regard to ventilation, if not more so.

So far as drainage is concerned, an equally bad state of affairs is found, and in 64 cowsheds the drainage was bad.

Under the heading of drainage I include the state of the floors, as in no case can the drainage be good if the floor is bad—that is to say, any portion of the cowshed floor on which the excreta may fall. In many cases the conditions seen are nothing short of scandalous; one example may be given in illustration.

At one of the farms visited (case 82) there was a large hole in the cowshed floor at least a foot deep, which was full of urine and dung, while the rest of the floor was sodden with liquid. This was the best cowshed on the farm, so that the condition of the rest may be imagined.

The materials used in the construction of the floors in the majority of the cowsheds are not conducive to an impervious floor or efficient system of drainage.

It is very common to find the floors made of bricks, which are easily broken, and soon displaced.

Cobbles and stone slabs are also used in some districts. The latter are particularly seen in Derbyshire, and are very often loose.

There is no objection to the use of any of these materials, so long as they are set in such a manner as to render the floor impervious to moisture, either from above or below.

The condition of cow-keeping in districts at some distance from the City has been treated with some fulness in the hope that this analysis may lead to some improvement. It has been shown in a previous report that insufficiency of food aids in the causation of tuberculosis, while it is certain that the conditions of lighting and ventilation described here must greatly favour the spread of the disease and hasten its progress, with the result of an early production of tuberculous milk.

The Following is a Summary of the Bacteriological Work done for this Department of Public Health Work by Professor Delépine during 1901 :—

Samples of mixed milks taken at the stations or otherwise in transit		442
Number and percentage declared to be capable of causing tuberculosis in the guinea pig (9·2 per cent.)		41
Number of farms affected		33
Number of samples taken by the Veterinary Surgeon as a result of visiting the farms thus indicated		184
Number of udders represented by the unmixed samples taken at farms thus indicated		158
Number of udders represented by the mixed samples taken by the Veterinary Surgeon at those farms		423
Number of udders from which samples were taken as a result of independent observation by the Veterinary Surgeon		50
Number of udders in each class shown to be tuberculous :—		
(*a*) By subsequent samples to tuberculous station samples	22	
(*b*) By samples taken as result of independent observation	7	
	—	29
Number of control samples submitted from farms		20
Number shown to be tuberculous		3
Total number of samples submitted for examination		624

J. W. Brittlebank.

THE FACTORY AND WORKSHOP ACT, 1901.

Under this Act the Medical Officer of Health is required to report on the action taken under the Act during the year. Except in regard to bakehouses, the Medical Officer of Health has not hitherto taken much direct part in the work of the Inspectors appointed under the Factories and Workshop Acts, so that the first report on the subject will necessarily be somewhat meagre. There are under the Manchester Sanitary Authority four men Inspectors and two women Inspectors for workshops and workplaces, the women Inspectors dealing more particularly with workshops employing women, and with work given out. Their duties are to report to the Sanitary Superintendent, and through him to the Sanitary Committee, on any failure to comply with the Acts, or with Section 91 of the Public Health Act, 1875, and also on any failure to comply with the provisions of the Shop Hours Act. Their reports come primarily before a Sub-Committee called the Shop Hours Sub-Committee.

The materials for estimating the effect of a particular workshop on the health of the operatives do not exist, and such are the uncertainties existing in reference to small and ill-ascertained particulars that any attempt to give a statistical statement would be futile. We have, in this respect, to trust to the known facts as to the causation of disease, applying them to the particular cases which arise.

It is possible, however, to obtain a preliminary idea as to the effects on mortality of particular classes of work, and a very complete and valuable compilation of statistics has been issued by Dr. Tatham in respect of the diseases of occupation. It remains to enquire how far we may assume that such statistics applied to the whole country are applicable to particular districts, and to Manchester in particular.

This I have attempted to do in a paper read before the Manchester Statistical Society in April, 1899; but that communication, based as it was on Dr. Tatham's volume, relates to males only, and deals specifically only with Lancashire industries. It is there shown that the factors interfering with a statistical judgment on the effects of occupation *per se* are considerable. These are influenced by the sanitary condition of the district, by the wages earned in the occupation, and by its indirect effects on habits of life. The last is a serious element. Thus the fluctuations in employment of such occupations as hatting, tailoring, etc., must have a serious effect on habits and health. All occupations involving continued exposure to a high temperature during work predispose to intemperance.

Then again, some occupations more than others are carried out on insanitary premises, and this will have an influence on health apart from the special influence inherent in the occupation itself.

It was found possible to eliminate intemperance as a cause of ill-health by observing that, where this was a predominant cause of disease, the mortality at early ages in the occupation so affected is low.

In this way, of those employing large numbers of persons, it was possible to affirm that the following occupations bear severely and directly on health —manufacturing chemistry, dyeing and printing, glass making, metal founding.

This analysis is not extended, however, to those classes of occupations which come more immediately under the Sanitary Committee, and, by reason of the sex factor, can only be partially so extended.

A further difficulty exists in the fact that, only so long as the preponderating numbers in an occupation are to be found in a district under consideration, can the general statistics be used with a due degree of care. But when, as in the case of tailors, we are trying to deduce from the mortality statistics the effect on health of this occupation in a crowded city, where many of them are working under conditions not very sanitary, it is not clear that the general statistics apply, and it becomes necessary to construct, if possible, our own statistics.

With these reservations, it is of interest to see what are the death-rates of large classes of workpeople, such as tailors and shoemakers, who are liable to work under conditions not altogether of the cleanest, especially in respect of phthisis.

Turning to the supplement to the 55th Annual Report of the Registrar-General, part ii., p. 41, above mentioned, we find that the death-rate of tailors is nearly the same as that of occupied males, but that they die much faster from phthisis.

The same is nearly true for shoemakers. The only important causes of death in which an excess is shown are phthisis and cancer.

For hairdressers, the mortality figures due to alcoholism, liver disease, gout, and phthisis show serious excesses.

The general statistics, then, of these occupations indicate quite specially the need for a special effort to secure thorough cleansing.

With these few preliminary remarks, I now pass to the work carried on by the Department.

The following is a summary of the work done by the Inspectors for the year ending April 30th, 1901 :—

Showing the work done by the Inspectors under the Factory and Workshop Acts in the year 1901.

Number of District	INSPECTOR	WORKSHOPS: Number of visits	WORKSHOPS: Number in which Sanitary defects were found	WORKSHOPS: Number of reports referred to Factory Inspector (unregistered factories, &c.)	WORKSHOPS: Number of cases in which Magisterial proceedings have been taken	WORKSHOPS: Number registered during the year	WORKSHOPS: Total number on register	Number of visits to houses where out-workers are employed	Factories and Workshops not provided with proper means of escape in case of fire	BAKEHOUSES: Number of visits	BAKEHOUSES: Number in which Sanitary defects were found	BAKEHOUSES: Number of reports referred to Factory Inspector	BAKEHOUSES: Number of cases in which Magisterial proceedings have been taken	BAKEHOUSES: Number registered during the year	BAKEHOUSES: Total number on register
a 1	Joseph H. Fowles...	2071	252	147	9	257	1135	2	7	259	36	3	3	2	77
2	John Kewley... ...	2979	239	108	7	258	1029	6	4	842	81	5	1	7	161
3	Ernest Bailey ...	2181	163	61	6	146	936	...	...	1128	131	1	...	10	134
4	Francis J. Rowe ...	3281	221	93	3	180	1090	...	5	874	2	4	...	15	153
...	Emma Coppock ...	2865	142	...	...	...	...	516	...	...	...	...	...	...	...
...	Ethel Stewart ...	2270	102	...	...	...	...	616	...	...	...	...	...	...	...
...	TOTALS	15647	1119	409	25	841	4190	1140	16	3103	250	13	4	34	525

a Inspector Fowles commenced duty November 5th, 1900.

I requested Mr. Rook to furnish me, as far as practicable, with a statement for 1901, which he has caused the Inspectors to prepare. This was to comprise the following points :—

INFORMATION WHICH IT IS DESIRABLE TO HAVE FOR THE ANNUAL REPORT.

1st.—A list of the workshops classified according to their presumed influence on health :

A—Workshops attended with the production of much dust.

B—Workshops in which the operatives are engaged in occupations which entail a confined posture.

C—Workshops in which the operatives are exposed to high temperatures.

D—Workshops found to be insanitary, with same for workplaces.

E—Others.

2nd.—The improvements carried out during the year 1901.

A—Ventilation.
B—Cleansing.
C—Lighting.
D—Water-closet provision.
E—Provision of cloak rooms and lavatories.

3rd.—The sanitary condition of the inferior class of workshops and workplaces, and a statement as to the general conditions under which work is conducted.

Special observations should be made as regards any particular class of workshops or workplaces as—*e.g.*, on the class of cellar workplaces used in certain parts of the town.

Also a detailed statement should be made as to the frequency with which workshops and workplaces are cleansed, with special reference to the floors, adjoining parts of the walls, spaces under workbenches and tables. The manner in which cleansing is carried out should be specially noted, as dry sweeping is inadequate.

The extent to which the notices respecting spitting are posted up should be given ; and wherever such notices are not found, an effort should be made to have them posted up.

It is important also to ascertain how far the practice of spitting in workshops has been abandoned.

4th.—It would be interesting to have information as to how far the operatives change their clothes before commencing their work, and what provision there is for change of clothing, if any.

5th.—Finally, a summary should be given of the operations of the Shop Hours, &c., Committee for the year, which, I presume, can be compiled from the current statements sent to the Committee.

There is also another class of information which would be useful, but is not likely to be immediately available, viz. :—

A—The average age of the operatives engaged in different kinds of work.

B—The wages earned.

C—The social position of the operatives.

B and C, of course, hang together.

A complete list of occupations pursued in the workshops visited by the Inspectors has been classified in the manner indicated, and will be useful for future work.

Only the summary can be given here :—

A—*Workshops Attended with Dust.*

The accompanying lists enumerate the shops where the work is attended with dust. A brief survey will show that the list is mainly composed of places used by lead-light makers, file cutters, paper sorters, stone masons, modellers, upholsterers, furriers, and others, where more or less dust is produced in the course of their employment.

Hemmers have been included on account of the china clay their work contains, which is a conspicuous feature wherever such work is done.

This list contains 229 workshops where such conditions prevail, and if we estimate each shop to average six people, we shall come to the conclusion that 1,374 people are occupied in such trades in workshops in Manchester.

Summary of Workshops in which much dust prevails.

Lead Light Makers	11
Engravers	6
File Makers	16
Brush Makers	24
Gilders and Blockers	3
Rag Dealers and Sorters	58
Chamois Leather Dressers	2
Furriers	13
Bass and Fibre Dressers	6
Upholsterers	19
Yarn Ballers	3
Bedding Manufacturers	8
Marble Masons	19
Dye and Colour Makers	16
Bag Making and Mending	3
Ending and Mending	4
Modellers	5
Hemmers	13
Total	229

B—*Confined Positions.*

The list of workshops which entail a confined position is mainly compiled of shops used by dressmakers, tailors, milliners, shoemakers, saddlers, shirtmakers, and others having this feature in common, that the operatives sit down to their work, and in many cases are compelled to stoop or bend over their tasks for hours at a time. These represent the largest number of workers. There are 1,529 workshops of this class, and a carefully estimated average of 12 per shop shows that 18,348 people are thus employed.

Summary of Workshops in which a confined posture is entailed.

Dressmakers, &c.	419
Tailors	418
Watchmakers, &c.	43
Umbrella Makers	21
Saddlers	49
Bootmakers, &c.	315
Skirt and Blouse Makers	16
Underclothing Makers	79
Cap Makers	25
Basket Makers	20
Brace Makers	6
Embroiders, Machinists, &c.	25
Waterproof Garment Makers	23
Total	1,529

C—*High Temperatures.*

This list is mainly a compilation of such workshops as laundries, workshops used by blacksmiths, enamellers, springmakers, sugar boilers, clog-iron makers, hat manufacturers, and others, in connection with which high temperatures obtain in some cases regularly and in others occasionally.

They comprise 203 shops, and a comparison of the respective districts yields an average of 5 to each shop, or 1015 workpeople subject to such influences.

Summary of Workshops in which high temperatures prevails.

Blacksmith, Whitesmiths, and Farriers	144
Sugar Boilers, &c.	8
Japanners	6
Laundries	43
Silk Hat Manufacturers	2
Total	203

D.

Other workshops on the register number	2,219
Total Workshops	4190

The Inspectors' joint report is herewith given, and will be found interesting :—

WORKSHOP INSPECTORS' REPORT FOR THE MEDICAL OFFICER OF HEALTH.

"The inferior class of workshops cannot be said to be in a satisfactory sanitary condition. The workers are drawn from the poorer class, and their work is badly paid, and is generally not of a remunerative character. Consequently the employers cannot afford to pay much rent, and usually take old buildings, such as condemned houses, or cellars, for workshops. This applies especially to those trades which require little or no capital to commence, and in which only a few persons are employed.

"It is most difficult in dealing with this class of workshop to maintain a satisfactory standard of ventilation. The persons employed being of the poorer class are, as a rule, ill-clad and without warm clothing, and have only in most cases the bare necessities of life. They are therefore very sensitive to the least draught, and they endeavour while at work to keep the room warm by closing all windows and openings. In this class of workshop the general surroundings are usually not conducive to a good sanitary condition. The premises are old—the roof is generally out of repair and sagging, and requires frequent repairing to keep it water-tight. The ceilings, walls, floors, and window frames are in a broken and dilapidated condition. Work is carried on in these places at the least possible expense to the occupier, who rarely makes much more than a living wage himself. The employés are mostly on piece work, and the work in most cases is subject to slackness of the seasons and bad trade through general depression; consequently they work at high pressure when work is abundant, and are in a state of poverty at other times. Work in these places is generally done at sweating prices.

"There are about 140 cellars in Manchester used as workshops. These, we are glad to say, are on the decrease. The general conditions are unfavourable to good health, and workmen are now more alive to the danger to health (such as rheumatism, etc.) caused by damp cellars. A number of these (about 20) in the Rochdale Road district will shortly be removed by the Rochdale Road improvement and the Lancashire and Yorkshire Railway extension. There are a number in the Ancoats district, mostly occupied by chair makers, table makers, etc. As a rule these cellars are damp, dark, and badly ventilated—dampness being the worst defect in connection with these cellars—and are used by persons in a small way, employing two to six men, on account of their cheapness, the rents varying from 1s. to 2s. 6d. per week. The workers in these places are poorly paid.

"Rag sorting is a class of work generally carried on under insanitary conditions. On account of fire insurance this trade is generally carried on in old buildings, often in a most dilapidated condition. The sorting of the rags gives off a large quantity of dust and other impurities, and although the rags are all sorted by hand it is very seldom that provision is found for washing. The sorters stand at benches, and (except in the warmest weather) invariably close all windows and openings. At a visit paid to a rag sorter's some time ago it was found that though the workpeople were away at dinner, all the gases were burning and the windows shut, so that the room would be warm when they returned. We would suggest that in all rag-sorting workshops mechanical means should be provided, where practicable, to carry off the dust and other impurities generated. The regular removal of the stock and refuse is most important in this class of workshop, to allow the premises to be thoroughly cleansed.

"Chamois leather dressing is a class of workshop which requires specially dealing with in regard to ventilation. The dust and dry fluff given off when dressing the leather is of such a nature as to be too heavy to be drawn away from the room by natural ventilation, and must be very injurious to the workers. A workshop of this kind has recently been referred to the Inspector of Factories to be dealt with by the provision of mechanical ventilation to carry off the dust, etc., generated (under Section 74 of the Factory and Workshop Act, 1901).

"Sack mending is also a class of workshop in which the employés are subject to large quantities of dust and other impurities. The empty sacks are brought to the workshop to be overhauled, and where broken to be stitched and mended. These sacks, which have contained flour, cement, whitening, etc., give off quantities of dust during the overhauling process, and these workshops should be specially dealt with in regard to ventilation.

"The frequency with which workshop floors are cleansed varies in different trades. In some cases, such as dressmakers, milliners, mantle makers, etc., the floors are swept daily and washed from weekly to monthly. In cabinet makers, etc., the floors are rough brushed daily, and thoroughly wet swept under benches, etc., weekly. The aim of the Inspector is to have all workshop floors, staircases, etc., swept and cleansed *regularly*. The cleansing of floors, etc., requires special attention in Jewish workshops, where the workmen smoke while at work. An effort will be made to have all work shop floors wet swept.

"Notices respecting spitting were taken some time ago to all the workshops, and the occupiers requested to hang them up in the workshop. This request was pretty generally complied with at the time. During the process of lime-washing workshops, card notices and abstracts very often get lost or mislaid, and employers do not take sufficient interest in this important question to see that the card is taken care of, and rehung in the workshop, knowing that the posting of it is not compulsory. Where the posting of notices, etc., is compulsory, care is taken by employers to have them renewed when lost.

"No provision is made for operatives to change their clothing in workshops. In some trades the workpeople put on overalls to work in, such as furrier cutters, but this is done more in the way of saving their clothes than from a health point of view.

"No dressing rooms are provided, and seldom a dining room, the female workers generally taking their meals at their own machines.

"The passages in the vicinity of the water-closets are generally used to hang their clothes, in which they travel to and from their work, and which are usually crowded together.

"D and E are dealt with in this report.

Work Done by the Inspectors during Year 1901.

"There have been 15,647 workshops visited during the year, and the following improvements have been carried out under notice at the various workshops :—

Overcrowding		14
Ventilation		78
Cleansing	Workshops	896
	Bakehouses	197
Lighting		19
Water-closet provision		103
Insanitary Workshop, &c.		133
Insanitary Bakehouses		17
Means of escape in case of fire		42
Total		1499

"An important consideration affecting this class of inspection may be here noted. Before serving a notice which may possibly lead to the Police Court, the Inspector has to be satisfied that the case is a bad one, in fact indefensible on its merits, and betwixt glaring defects of this kind and satisfactory conditions there is obviously a wide margin showing various degrees of defects of a less pronounced character. Operating along that margin by advice and suggestion to owners and occupiers, the Inspector gets much of his work done without recourse to the official notice, and consequently without statistical record. Many important alterations and improvements have been effected in this way, when the owners or occupiers have been tractable and willing to comply, which do not appear in the above summary. In future all such work wiil be put on record."

The following statement on home work has been prepared by the Lady Inspectors :—

REPORT re OUTWORKERS.

"The Female Workshop, &c., Inspectors report that thehouses occupied by outworkers generally consist of four rooms (two up and two down), rents about 6s. per week. There are, however, some few instances where work is carried on in single houses (one room up and one down), the rents of which run from 3s. to 4s. 6d. per week.

"In the former cases the number of occupants vary from two to 10 persons ; in the latter the houses are occupied by widows with small families or single women.

"The occupiers of houses in which shirt making is done are generally the most indifferent as to cleanliness, &c., and this is attributable to the fact that the husbands are unskilled workmen, in receipt of poor wages, and often out of employment, while the low prices paid to outworkers for this class of work necessitate constant attention being given to do sufficient work to make it at all remunerative.

"In houses where tailoring, underclothing, pinafore and blouse making is carried on the outworkers are generally of a better class, the prices paid for the work being higher on account of the more skilled workmanship.

"These houses are generally found in a cleanly condition, and, as a rule, comfortably furnished.

"In all cases of dirty or insanitary conditions of houses advice is given to the occupiers by the Female Inspectors as to the necessity of cleanliness, &c., and in the event of negligence the attention of the District Sanitary Inspector is drawn to the matter, who usually serves a notice to remedy any defects.

"Contractors generally occupy rooms not used for dwellings, and these are registered as workshops, in which as a rule from four to 12 persons are employed, the Jews being chiefly engaged as contractors.

"This class of workshop is kept in a fairly satisfactory condition.

"The following table shows the classification of trades, the number of persons employing outworkers or contractors, and the number so employed, 622 of which are resident outside the city.

Trades	No. of Employers	No. of Outworkers or Contractors employed
Tailors	132	875
Dress, Mantle, Costume, Shirt, Blouse, &c., Makers ...	70	1059
Ladies' and Children's Aprons, Pinafores, and Underclothing Makers	33	481
Men's Shirt Makers	20	347
Boots, Slippers, &c., Makers	46	230
Handkerchief Hemmers	18	417
Umbrella Trimmers	13	193
Quilt, Cosey, and Cushion Makers	2	16
Stay and Corset Makers	3	14
Cabinet, Upholstering, Wood Carving, and Picture Framing	8	17
Berlin Wool Workers and Hand Embroiderers	3	21
Rubber and Fur Workers and Opticians	5	9
Paper Bag and Hat and Cap Makers	4	13
Rope Makers	1	10
	358	3702

"During the year 102 factories and workshops have been reported as being insufficiently supplied with closet accommodation, or the accommodation provided not being in a satisfactory condition. In 33 the necessary accommodation has been provided, and in the other cases orders have either been made by the Committee or are being attended to by the owners under the direction of the City Surveyor."

I have to remark on the statement prepared by the Male Inspectors that, it is somewhat melancholy reading.

During the investigation into a small outbreak of Typhus in the beginning of 1901, I was informed with regard to one tailoring establishment that it was the custom to spit among the clippings. In fact I was told that spittoons were made of them. From what I have heard at other times there is reason to fear that the habit of spitting is not uncommon. Now, so far as I understand the Factory and Workshop Acts, there is ample power to require cleansing and disinfection to be carried out under such circumstances, and I am strongly of opinion that whenever it can be proved that the workpeople have been spitting on the floor or walls, a notice to cleanse should be served.

Under the Factory and Workshop Act, 1878, a workshop was included under the term "house" as used in the Public Health Act, 1875, and is therefore subject to cleansing when in the opinion of the Medical Officer of Health such a procedure would tend to prevent or check the spread of infectious disease.

No Medical Officer of Health now entertains any doubt that sputum on floors or walls is the most serious form of dirt, and urgently demands removal by a thorough cleansing.

I submit, therefore, that as the term "house" includes factories, in all factories and workshops (1) "Notices" should be suspended prohibiting spitting on the floors or walls; (2) spittoons containing water should be provided by occupiers, into which persons affected with a chronic cough can easily and conveniently spit; (3) Inspectors should diligently enquire whether these precautions are properly observed, and act accordingly.

In their report on the cleansing of workshops the Inspectors deal specifically with the question of dry or wet sweeping. It is imperative in the interests of health that cleansing should be by wet sweeping, the floor having been previously moistened, and from time to time, say once a month, a cheap disinfectant, such as a solution of bleaching powder of approved quality, should be brushed on the floor.

The question of ventilation is a more complicated one. The remarks of the Inspectors deserve consideration. It would be well worth while to make an effort to determine whether the conservation of energy could be more cheaply obtained by warm woollens or by careful dieting. If it should appear, as I suspect, that the former is the cheaper, then workpeople should be strongly urged to wear good woollen underclothing.

But underlying the question of ventilation, very frequently, is the cleanliness and mode of cleansing of the factory and workshop. Unless the workshop is free from dust no mode of ventilation can be quite satisfactory. The first requisite, then, is cleansing of the workshop, carried out in a proper manner.

Ventilation and lighting must be considered in reference to each individual case, but cleansing is a universal requirement, as to which definite rules can be laid down.

The provision of lavatories, of dressing and of dining rooms, will be seen to be of the most elementary and imperfect character. How far such provision is generally possible in small workshops I am not prepared at present to say. Certainly in all larger workshops sufficient provision ought to be made, and the clothes worn by operatives should not be crowded together in the ante-chambers of water-closets. This is a sure way of bringing infection from without into the workshop. I do not wish, however, in the absence of personal inquiry, to make any further statement on the matter at present.

THE FACTORY AND WORKSHOP ACT, 1901—continued.

BAKEHOUSES.

The following are the particulars of the action taken during the year 1901:—

Bakehouses altered to Specification.

Address	Date
1 Court, Jenkinson Street	February 9th, 1901
26, Rochdale Road, Harpurhey ...	August 1st, 1901
35 and 37, Chapman Street	February 16th, 1901

Bakehouses Closed during the Year.

Address	Date
66, Back Grafton Street...	February 8th, 1901
22, Blossom Street	January 30th, 1901
10, Bentinck Street...	March 11th, 1901
26a, Radnor Street	March 12th, 1901
Pickstone Street, Harpurhey ...	March 19th, 1901
132, Medlock Street...	April 17th, 1901
3, Nightingale Street	May 14th, 1901
164, Wilmslow Road...	May 15th, 1901
126, Rochdale Road, Harpurhey ...	June 17th, 1901
54, Rusholme Road...	June 24th, 1901
436, Mill Street, Bradford	July 19th, 1901
124, Oldham Road	August 3rd, 1901
132, Church Street, Newton Heath...	October 31st, 1901
137, Denmark Road...	August 20th, 1901
3, St. Ann's Passage	September 17th, 1901
102, Ashton New Road, Beswick ...	November 12th, 1901
520, Oldham Road	December 15th, 1901

Statement of the number of Bakehouses approved by the Improvement and Buildings Committee, and completed during the year 1901.

Situation	Date of Approval and Owner	Date of Completion
Bakehouse, No. 9, Stockport Road, Ardwick	26th June, 1901, W. Whiteley	22nd October, 1901
Bakehouse, Darley Street, Ardwick	9th May, 1900, W. Darbyshire & Co.	4th July, 1901

On September 23rd, 1901, the Medical Officer of Health presented to the Shop Hours Sub-Committee a report giving a detailed account of the inspection of a number of bakehouses and a complete list of the underground bakehouses altered or closed up to date since 1894.

The preliminary portion of this report and a summary of the action taken year by year, including 1901, is herewith given:—

"Public Health Office,
"Town Hall, Manchester,
"23rd September, 1901.

"To the Chairman of the
Shop Hours Sub-Committee.

"The Medical Officer of Health would remind the Chairman of this Sub-Committee that an effort has been made in the City of Manchester since the year 1894 to amend the very insanitary conditions of cellar bakehouses.

"During the year 1895 a form of specification was prepared in the City Surveyor's Office, on which, as a basis, the alterations required in cellar bakehouses were in each case recorded. These specifications were then sent to the tenants of bakehouses, which were thereupon altered so as to comply with the requirements of this Sub-Committee, or closed.

"The preparation of each of these specifications implied a very considerable amount of work, and entailed a visit from the Medical Officer of Health, and from the officer of the City Surveyor's Department responsible to the Sanitary Committee.

"A complete list of bakehouses closed or altered is herewith given.

"The chief defects requiring to be remedied in regard to cellar bakehouses have been these:—

"(1) The impossibility of getting sufficient daylight into them, and consequent difficulty in keeping them clean. It may be possible, in some instances, to overcome this defect by means of the electric or other light.

"(2) In many cases the walls are damp. This defect may be overcome by inserting an internal wall of glazed brick bonded to the existing wall, and ventilated to the exterior.

"(3) The irregularity of the surfaces, allowing the lodgment of dirt. This defect also can be removed.

"(4) The impossibility of cleaning the bakehouses on account of the large fixed pieces of furniture. For the most part this defect can be got over by providing the furniture with strong castors.

"(5) The insufficient height of the bakehouses. This is a very serious defect indeed, as it renders the proper exchange of air in the bakehouse almost impracticable, and, as a matter of fact, these cellar bakehouses have been found very difficult to ventilate.

"(6) Defective ventilation in the bakehouse.

"(7) The admission of dust through the windows, the tops of which are generally on a level with the pavement, and, if there are external doors, also through the doors of the bakehouse. Many bakehouses become very speedily dirty for this reason.

"Defects 6 and 7 must be taken together, and an effort has been made to overcome the difficulties by taking advantage of the means of heating and lighting in the bakehouse, such as oven flues and gas gets, for extracting foul air and by introducing a supply of clean, fresh air from outside through inverted Tobin tubes, the external openings of which are placed at a sufficient height from the ground. In other cases special extraction shafts have been provided. As a matter of fact these devices are very frequently inadequate to overcome the friction arising from the ceilings and walls of the bakehouse, and the benefit derived from this mode of ventilation is often incommensurate with the expense incurred. This is the greatest difficulty to be encountered in dealing with cellar bakehouses. If a sufficient exchange of air could be obtained the other defects would generally be remediable, although often at great expense.

"It is provided by the Factory and Workshop Act, 1895, that no drain carrying fæcal or sewage matter must open in the floor of any bakehouse, and this clause is reproduced in the Factory and Workshop Act, 1901 (section 97, sub-section 3).

"A few of the existing bakehouses have an opening into the drains, but it has been felt inadvisable to call for an entire reconstruction of the drainage unless we were prepared to deal with the bakehouse as a whole and to remedy the sanitary defects in their entirety. Therefore, at the present time, there is a small number of cellar bakehouses in which the entrance to the drains has not been carried outside.

"In the new Factory and Workshop Act, 1901, the following provisions occur (section 101, sub-sections 1-7 attached).

"It seems quite clear that it is intended by means of this section to put a period to the existence of most of the cellar bakehouses, and to leave only those which are of exceptional excellence. In a comparison of underground bakehouses, it is quite certain that a large proportion of the existing cellar bakehouses in Manchester could not be regarded by this Sub-Committee as suitable in respect of construction, light, ventilation, etc.

"The clause in the new Act relating to the closing of cellar bakehouses comes into force on January 1st, 1904, and we shall then be in an entirely different position with regard to cellar bakehouses, as it will be the duty of the Authority, unless they are prepared to give a certificate, to enforce the closing of these places. It is very undesirable that such a situation should be brought about abruptly, and some action seems to be required, so that when the time arrives the Committee will not be compelled to take any action which may seem either harsh or inadequate.

"The Medical Officer of Health would suggest that a copy of Section 101 of the Factory and Workshop Act, 1901, be sent to every tenant of a cellar bakehouse, and that he be invited either to declare his intention of closing his bakehouse at the period named in the Act, or to put forward a claim within a reasonable period, say within the next six months, that his bakehouse should be allowed to be used after the Act comes into operation on a certificate of the Sanitary Authority. The tenants of cellar bakehouses might at the same time be informed that unless a distinct claim for continuance of the bakehouse is put forward before the end of the next six months, or other fixed period, so as to give ample time for the consideration of the alterations necessary to render the bakehouse sanitary, and for seeing that they are carried out, the Committee will not consider themselves under any obligation to grant a certificate when the time arrives.

"The time fixed by the Act, namely, January 1st, 1904, at which the above provisions come into force is so near that the Medical Officer of Health anticipates that not a few bakers will consider that they have a right to use their bakehouses beyond this period, and all the intervening time will be required to adjust differences of opinion and to carry out the necessary alterations.

"The Medical Officer of Health has recently visited the worst of the cellar bakehouses submitted to him by the Inspectors to the number of 23, and presents to the Chairman of this Sub-Committee a brief statement of the conditions in respect of which these bakehouses are insanitary. With regard to some of them the sanitary conditions are so bad that immediate action seems called for. In the case of others, it may for the present suffice if they are kept thoroughly clean, and if the necessary alterations are made in the furniture so as to facilitate the cleansing of the bakehouse. In all of them, however, great doubt exists as to the possibility of their being satisfactory at the end of the period named, and, in the opinion of the Medical Officer of Health, in many of them no certificate could be given without extensive changes.

"The letter which it is suggested should be sent to the tenants of all cellar bakehouses will be applicable not only to those which are mentioned in the list, but to many others in which alterations have already been carried out. In many instances the tenants were warned that the carrying out of the specification was not to be considered as rendering the cellar bakehouse entirely suitable from a sanitary point of view, but were to be looked upon as satisfying merely the most urgent requirements of these bakehouses as regards the health of the workpeople and the cleanliness of the bread."

"EXTRACT FROM THE FACTORY AND WORKSHOP ACT, 1901.

(Ch. 22. 1 Edw. vii.)

Prohibition of underground bakehouses

"**101.**—(1) An underground bakehouse shall not be used as a bakehouse unless it was so used at the passing of this Act.

"(2) Subject to the foregoing provision, after the first day of January, One thousand nine hundred and four, an underground bakehouse shall not be used unless certified by the district council to be suitable for that purpose.

"(3) For the purpose of this section, an underground bakehouse shall mean a bakehouse any baking room of which is so situate that the surface of the floor is more than three feet below the surface of the footway of the adjoining street, or of the ground adjoining or nearest to the room. The expression "baking room" means any room used for baking, or for any process incidental thereto.

"(4) An underground bakehouse shall not be certified as suitable unless the district council is satisfied that it is suitable as regards construction, light, ventilation, and in all other respects.

54 and 55 Vict. c. 76.

"(5) This section shall have effect as if it were included among the provisions relating to bakehouses which are referred to in section twenty-six of the Public Health (London) Act, 1891.

"(6) If any place is used in contravention of this section, it shall be deemed to be a workshop not kept in conformity with this Act.

"(7) In the event of the refusal of a certificate by the district council, the occupier of the bakehouse may, within twenty-one days from the refusal, by complaint apply to a court of summary jurisdiction, and if it appears to the satisfaction of the court that the bakehouse is suitable for use as regards construction, light, ventilation, and in all other respects, the court shall thereupon grant a certificate of suitability of the bakehouse, which shall have effect as if granted by the district council."

"The following table shows the amount of work done since the commencement of operations in 1894:—

Year	Bakehouses Altered	Bakehouses Closed
1894	3	3
1895	16	12
1896	28	19
1897	22	31
1898	18	17
1899	12	18
1900	8	13
1901	3	17
	110	130
	Total, 240."	

(End of Extract.)

The alterations here mentioned are in all cases extensive, and are, for the most part, carried out according to careful specifications drawn up in the City Surveyor's Department, to comply with the requirements of the Medical Officer of Health.

In continuation of the above report, a circular letter has been issued to the tenants and landlords of underground bakehouses, requesting that those wishful to have their bakehouses continued after 1904 should send in an application to that effect.

Herewith are given circular and form of application:—

"Enclosure.

"Public Health Office,
"Town Hall Manchester,
"January 1st, 1902.

"Dear Sir,—I am instructed by the Sanitary Committee to draw your attention to the enclosed extract from the Factory and Workshop Act, 1901. I am to request that, if you desire a certificate under that section, you will make an application to the Sanitary Authority on the enclosed form within six months from the date of this circular, as the consideration of some cases may take a considerable time.

"Yours obediently,

"MEDICAL OFFICER OF HEALTH."

"Date ....

"FORM OF APPLICATION.

"I beg to state that it is my intention to apply to the Sanitary Authority of the City of Manchester for a Certificate that my underground bakehouse is suitable, in accordance with Section 101 of the Factory and Workshop Act, 1901.

"Signature of Tenant ....
"Address of Bakehouse ....
....

"The Medical Officer of Health."

A large number of applications have been received, and they will be considered together.

On January 29th, 1902, a deputation from the Manchester Master Bakers' Association was received by the Chairman and Deputy Chairman of the Sanitary Committee, and by the Chairman of the Shop Hours Sub-Committee, and urged—(1) that definite principles should be laid down for the alteration of cellar bakehouses; (2) that if the law were very strictly construed in Manchester, and not in neighbouring districts, this would bear very hardly on Manchester bakers.

It was pointed out that each bakehouse must be dealt with separately, and that the Act evidently contemplated a pretty strict interpretation of the term *suitable.*

Although no definite rule can be laid down now, when the Act of 1901 has entirely altered the position of cellar bakehouses, it may be pointed out that certain requisites were formerly indicated by the Medical Officer of Health in the Annual Report of 1898.

These were :—

(*a*) The cellar to be not less than 8ft. in height throughout.

(*b*) All statutory requirements to be fulfilled.

(*c*) The bakehouse to be completely and effectually separated from any insufficiently lighted or insufficiently ventilated or damp cellarage.

(*d*) The ventilation of the bakehouse to be such that the amount of carbonic acid in the atmosphere of the bakehouse while work is going on shall not exceed 1 per 1000 by volume, such determination not to be made directly after the wagon is withdrawn.

The temperature of the bakehouse, except for an hour after the drawing of a batch of bread, not to exceed 85° Fahr.

The arrangements for ventilation to be in all respects satisfactory to the Medical Officer of Health.

(*e*) The floors and walls of the cellar to be impermeable to damp.

(*f*) The floors, walls, and ceiling to be smooth and even throughout, and the ceiling to be impervious to dust.

(*g*) The flour store to fulfil the same conditions as the bakehouse.

(*h*) Access to be provided to a water-closet outside the bakehouse and connected rooms.

(*i*) The entrances into the bakehouse to be clean, well lighted, and not such as to lead to the admission of dust into the bakehouse.

(*j*) The bakehouse to be efficiently lighted by daylight in such a manner as not to admit dirt.

(*k*) The tables and proving troughs to be provided with strong ball-bearing castors.

(*l*) The space for each workman to be not less than 500 cubic feet.

Although these can no longer be regarded as applicable, they may still serve as a minimum of what will be required.

The great difficulty hitherto experienced has been that of ventilation. It has been found almost impossible to prōduce a sufficient current of fresh air through cellars, especially through cellars of insufficient height, to keep them reasonably fresh and cool.

Should it be found possible to overcome this difficulty in the better class of cellars, the other difficulties would not be insurmountable. It is this point which we must thoroughly investigate.

One great difficulty is lighting, but now that the electric light is becoming more available, good lighting without injurious effluvia is becoming possible.

Moreover, the Chairman of the Shop Hours, &c., Sub-Committee (Councillor Marsden) believes that he has found means to get the maximum of light, with perfect combustion, from a modification of the intensive use of coal gas, and, as far as I can judge, that is so.

Such a light will, of course, radiate more heat than the electric light, but great part of this heat may be used to assist the movement of air from the bakehouse.

Fresh air, as explained in previous reports, is brought in by inverted Tobins, and this method also is susceptible of improvement, chiefly in the way of more extensive use.

It will, however, be a good thing for bakers when it is found possible altogether to put a period to the use of underground bakehouses.

HOUSING OF THE WORKING CLASSES.

This intricate and difficult problem continues to receive the constant attention of Sanitary Authorities, although, as may be seen from the reports of the discussion which took place recently at Glasgow, opinions differ widely as to the steps required to solve it.

The baffling element is the social one. From whatever cause arising, there appears to be at present a greater amount of pauperism than has existed in previous recent years, as has already been pointed out under the heading of "Statistics," and, in any case, it is the factor of poverty which renders the provision of sanitary dwellings difficult.

The causes of the increased pauper death-rate deserve most careful inquiry and consideration. It will be seen, however (under "Statistics"), that the explanation of the excess in 1901 appears to be peculiar and interesting

What, now, is the relation of poverty to the housing question? If times are prosperous, there is a demand for house accommodation which may reach such a point that landlords can raise their rents even for the most miserable houses. There is, at this time, overcrowding simply from excess of persons over the houses to accommodate them.

As a result, a large number of new houses are erected, perhaps more than are necessary to accommodate the population. Rents fall, and for a time there is an improvement in the conditions of housing. But if trade is seriously diminished, the advantages gained in this way are more than counterpoised by the loss in other directions, and the poorest people leave their houses to club with some other poor family. Thus, depression of trade leads to crowding as much as, or more than, great prosperity.

At all times there is a certain amount of overcrowding, especially in the poorest districts.

I am of opinion that until the causes of the great mass of pauperism which our statistics reveal are thoroughly ascertained, we are in no position to assert that the provision of a cheap house will help us much in solving the housing difficulty while, on the other hand, it is possible in this direction to create difficulties for the future. There are, however, some things which can be done, and which need to be done. Where workpeople are compelled to live near their work, the Sanitary Authority can see that the statutory provisions made for their protection are carried out.

When the houses which they inhabit suffer from some serious inherent defect, such as dampness, or from their being built on unsuitable material without proper foundations, the Sanitary Authority can condemn them as unfit for human habitation, and cause such alterations to be made as will render them fit.

Where from the manner in which streets have been planned, or from the defective provision of closet accommodation, or of drainage, or from any other structural and removable condition, houses are dangerous to the health of the inmates they should be closed permanently or until the dangerous conditions are removed. For this purpose a house to house inspection and register should be made and maintained.

Where the habits of the inmates are such that the houses become dirty or infected. they can be cleansed. For this purpose also a house to house inspection and register are required. In this connection it may be noted that new duties are imposed on the Sanitary Authority by the Factory and Workshop Act, 1901.

Where overcrowding prevails it should be treated as a nuisance as provided by Section 91 of the Public Health Act, 1875. No doubt this form of nuisance has to be dealt with cautiously. But that is no more than to say that each case must be treated on its merits.

In practical action, this broad principle would prevail that where there is a large family, all young, and none working, action should rarely be taken. When, on the other hand, there are adolescents earning enough to allow of a larger rent being paid, the law should be enforced.

Wherever there is filth about a house, the danger to the inhabitants of contracting some dangerous form of disease is greatly increased. Such, for example, is the case with houses having midden closets abutting on, or close to them. Such is also the case with back-to-back houses generally.

Over some areas houses were formerly built on land on which putrefiable material had been tipped, and that often without adequate protection of the foundation area. In my opinion, such land is not, as a rule, fit for building purposes within a period of twenty years, and even after the lapse of that period the most stringent precautions need to be taken to protect the foundation area. Even after this lapse of time, houses built on tips may entail bad health and give the plainest evidence of decay underneath.

Where such precautions have not been observed, the foundation areas should still be protected.

Workshops should not be erected on made ground, except with the same reservations and precautions as attach to dwellings.

Should the contents of sewers in flood times back into cellars, this should be regarded as a filth condition of the most dangerous character, and treated accordingly.

In my opinion, it is by work of this character, steadily and strenuously pursued, that the difficulties of the housing problem may be largely met, at all events, in this City.

It is true much has already been done in the way of removing filth conditions in the soil by the drainage improvements which have been carried out in the last few years. This is, perhaps, the direction in which the conditions of housing, including employment in warehouses and factories, have been most advanced in Manchester within the last two years. A considerable amount of effort is also being expended on getting the interiors kept clean in cases of consumption, but I am convinced that the dirty condition of a considerable section of the houses is one of the greatest obstacles to improvement with which we have to contend. It would be too much to hope that people can generally be induced to bestow great pains on the cleanliness of the interiors in cases where there is much filth close to the dwelling, or when it is overshadowed by neighbouring buildings.

Where, however, the arrangements for the collection of refuse are such as to give no excuse for a dirty yard, and where the house-yard and passage adjoining are well paved and in good condition, there should be no great difficulty, in general, in getting houses kept tolerably clean.

There is very great room for improvement. But, so far as I can judge, what Manchester suffers from is not so much excessive overcrowding as the faulty arrangement of dwellings and their belongings in the past, defects in foundation or structure leading to nuisances or dampness, and want of cleanliness in the houses.

It is not, perhaps, too much to say that in a considerable section of the houses the housewives have no conception of what is implied by the term a cleanly house. No administrative measure, no housing scheme can remove this source of failure. The relations of the working classes to life are constantly changing, and it is very notable of late years that young women prefer working in the factory or workshop to domestic service to such an extent that there is a great dearth of domestic servants, who come mostly from the country. Under such circumstances, the ideas of house cleansing of the working classes are not stimulated, and new forces require to be called into action.

I am strongly of opinion that it is the duty of the Education Department to exact from boys and girls, before they leave school, proof that they know the elementary principles involved in the cleaning of houses.

It is true the Sanitary Authority itself does a good deal of education, some of which takes hold. But, valuable as such instruction is, the effect is small compared with what might easily be produced by the School Authorities.

We cannot have too much voluntary effort engaged in the same work such as that done by the Ladies' Health Society.

An entire change is needed in the ordinary acceptation of the term cleansing.

Meantime, by a more strenuous and persistent application of the Statutes and Local Enactments dealing with housing, a great deal can be done to improve the health of the City.

For some time very little has been done by way of closing insanitary dwellings. The closing of insanitary dwellings, it is proper to state, has during the present year been renewed with vigour. Previous to 1901 a large number of back-to-back dwellings had been closed by the Unhealthy Dwellings Sub-Committee, of which, from its inception, Alderman Walton Smith has been chairman. To him is due, in large measure, the partial removal of the reproach which this class of house constitutes to the City. I am indebted to Mr. Rook for the following complete statistical statements of the operations of the Committee, which has been prepared by one of his clerks (Mr. Dale).

RETURN SHOWING THE NUMBER OF HOUSES CLOSED, DEMOLISHED, OR ADDED TO OTHER HOUSES, THEREBY BEING DISCONTINUED AS SEPARATE HABITATIONS (SUMMARY OF FOLLOWING SHEETS "A B C"), ON THE RESPECTIVE SANITARY DISTRICTS WITHIN THE CITY IN EACH YEAR, FROM FEBRUARY 1885, TO DECEMBER 31ST, 1901 (JANUARY TO DECEMBER IN EACH YEAR).

Sanitary District	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	Totals
1	...	11	9	4	27	2	...	40	15	32	...	14	11	7	63	...	...	235
2	7	15	2	76	42	3	54	55	21	144	84	...	...	9	...	7	...	519
3	...	...	3	26	71	34	20	98	47	29	47	29	30	5	33	18	...	490
4	...	...	...	2	...	7	...	3	...	...	. .	...	...	14	1	...	...	27
5	...	...	...	...	...	...	...	1	...	...	...	...	3	...	. .	...	...	4
6	...	10	51	16	43	16	...	71	...	138	65	7	55	2	56	6	...	536
7	...	...	...	3	...	13	...	32	...	6	...	...	7	...	73	...	...	134
8	...	...	...	2	...	...	...	. .	14	...	...	...	...	...	5	...	...	21
9	...	31	39	5	29	25	...	14	36	59	81	64	66	27	30	30	...	536
10	43	4	12	1	1	5	11	29	24	57	171	...	40	33	1	10	...	442
11	...	...	6	...	1	3	31	8	1	4	...	113	24	7	47	27	...	272
12	...	...	...	1	25	18	4	22	22	...	...	...	...	12	...	...	...	104
13	...	...	...	6	...	5	...	...	2	...	4	1	...	...	...	2	...	20
14	...	...	...	4	17	14	21	...	116	...	...	41	28	61	...	...	...	302
15	...	10	...	16	...	9	32	44	...	...	134	...	...	...	19	...	...	264
16	...	...	...	...	...	...	...	...	...	...	...	...	3	14	...	...	...	17
17	...	...	1	2	...	11	22	20	63	...	2	3	...	1	25	...	...	150
18	4	12	...	27	21	...	8	11	40	212	...	123	2	3	...	2	...	465
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Blackley 20	...	...	...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	6
Harpurhey 20	...	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	6
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	32	...	...	25	...	20	4	15	6	12	...	114
23	...	...	...	...	...	...	6	3	...	...	...	10	...	...	...	...	...	19
Beswick 24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bradford 24	...	...	...	...	...	...	4	1	...	...	...	...	...	23	16	...	...	44
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	3	...	6	...	...	3	2	2	...	16
Ardwick 27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
West Gorton 27	...	...	...	...	...	...	...	...	...	...	...	6	...	...	7	...	...	13
28	...	...	...	...	...	...	13	10	3	..	...	...	...	...	...	...	...	26
Totals	54	93	123	191	277	171	263	462	407	706	595	431	273	236	384	116	...	4782

Number of Houses Closed in each Year which have not up to the present time been allowed to be re-opened.

Sanitary District		1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	Totals
	1	...	11	5	...	7	2	...	2	4	2	...	8	3	1	48	...	...	93
	2	...	...	...	3	15	...	4	33	11	10	23	...	...	7	...	...	...	106
	3	...	...	...	6	6	2	1	9	27	9	9	5	30	1	11	18	...	134
	4	...	...	...	...	...	...	...	3	...	...	...	...	...	7	1	...	...	11
	5	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
	6	...	2	4	4	16	10	...	23	...	23	25	7	22	...	12	4	...	152
	7	...	...	...	...	...	1	...	...	...	...	...	...	5	...	46	...	...	52
	8	...	...	...	2	...	...	...	...	...	...	...	...	...	...	5	...	...	7
	9	...	...	4	...	4	4	...	4	18	7	...	19	26	1	2	...	...	89
	10	...	...	2	...	...	...	...	...	6	1	4	...	20	17	...	...	...	50
	11	...	...	1	...	...	...	...	...	...	...	...	8	...	...	1	...	...	10
	12	...	...	...	1	4	...	1	...	6	...	...	...	...	...	...	...	...	12
	13	...	...	...	...	...	1	...	...	2	...	4	...	...	...	...	...	...	7
	14	...	...	...	...	11	4	...	...	55	...	...	...	5	15	...	...	...	90
	15	...	5	...	...	...	...	32	14	...	...	...	...	...	...	7	...	...	58
	16	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	4
	17	...	...	...	1	...	4	3	...	...	...	2	3	...	1	...	...	...	14
	18	...	...	...	4	4	...	...	2	10	70	...	7	...	3	...	...	...	100
	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Blackley	20	...	...	...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	6
Harpurhey	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	22	...	...	...	...	...	...	8	...	...	...	...	8	...	...	...	...	...	16
	23	...	...	...	...	...	...	...	...	...	...	...	6	...	...	...	...	...	6
Beswick	24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bradford	24	...	...	...	...	...	...	...	1	...	...	...	...	...	1	5	...	...	7
	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	26	...	...	...	...	...	...	...	...	3	...	...	...	...	1	...	...	...	4
Ardwick	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
West Gorton	27	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	2
	28	...	...	...	...	...	...	...	1	3	...	...	...	...	...	...	...	...	4
Totals.........		...	18	16	21	67	28	54	92	145	122	68	73	112	59	138	22	...	1035

"B"

Number of Houses Closed in each Year which have been subsequently demolished.

Sanitary District	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	Totals
1	...	...	2	...	13	...	...	20	11	30	...	6	8	1	10	...	...	101
2	3	3	2	49	14	3	41	21	10	134	56	...	...	1	...	1	...	338
3	...	...	3	13	50	10	10	46	1	14	28	17	...	...	16	...	...	208
4	...	...	...	2	...	1	...	...	...	...	...	...	...	7	...	...	...	10
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	25	2	17	...	...	40	...	72	33	...	29	2	17	2	...	239
7	...	...	...	...	...	5	...	32	...	6	...	...	2	...	25	...	...	70
8	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	2
9	...	29	20	2	23	10	...	6	10	42	49	33	24	25	23	30	...	326
10	39	2	5	...	1	...	5	20	13	45	131	...	17	12	...	5	...	295
11	...	...	1	...	1	3	9	5	1	2	...	81	20	5	41	17	...	186
12	...	...	...	...	16	14	3	3	5	...	...	...	...	2	...	...	...	43
13	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	...	3
14	...	...	...	2	...	...	2	...	51	...	...	35	18	43	...	...	...	151
15	...	...	...	14	...	4	...	21	...	...	108	...	...	...	9	...	...	156
16	...	...	...	...	...	...	...	...	...	...	...	...	2	7	...	...	...	9
17	...	...	...	...	...	4	8	18	48	...	...	...	...	...	25	...	...	103
18	4	11	...	21	15	...	2	4	7	115	...	92	2	...	...	1	...	274
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Blackley 20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Harpurhey 20	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	5
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	16	...	...	5	...	12	4	9	4	3	...	53
23	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	3
Beswick 24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bradford.................. 24	...	...	...	...	...	...	2	...	...	...	...	...	...	14	7	...	...	23
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...	...	...	...	4	...	...	2	1	1	...	8
Ardwick 27	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	2
West Gorton 27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	...	6
28	...	...	...	...	...	...	9	9	...	...	...	...	...	...	...	...	...	18
Totals...............	46	45	58	105	150	60	107	248	159	465	409	278	126	130	184	62	...	2632

Number of Houses Closed in each Year, and subsequently added to other Houses, thereby being discontinued as separate habitations.

Sanitary District		1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	Totals
	1	...	...	2	4	7	...	...	18	...	...	...	...	...	5	5	...	...	41
	2	4	12	...	24	13	...	9	1	...	...	5	...	...	1	...	6	...	75
	3	...	...	...	7	15	22	9	43	19	6	10	7	...	4	6	...	...	148
	4	...	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	6
	5	...	...	...	...	...	...	...	1	...	...	...	...	2	...	...	...	...	3
	6	...	8	22	10	10	6	...	8	...	43	7	...	4	...	27	...	...	145
	7	...	...	...	3	...	7	...	...	...	...	...	...	...	...	2	...	...	12
	8	...	...	...	...	...	...	...	...	12	...	...	...	...	...	...	...	...	12
	9	...	2	15	3	2	11	...	4	8	10	32	12	16	1	5	...	...	121
	10	4	2	5	1	...	5	6	9	5	11	36	...	3	4	1	5	...	97
	11	...	...	4	...	...	...	22	3	...	2	...	24	4	2	5	10	...	76
	12	...	...	...	...	5	4	...	19	11	...	..	..	...	10	...	...	...	49
	13	...	...	...	6	...	3	...	...	...	...	...	1	...	...	...	...	...	10
	14	...	...	...	2	6	10	19	...	10	...	...	6	5	3	...	...	...	61
	15	...	5	...	2	...	5	...	9	...	...	26	...	...	...	3	...	...	50
	16	...	...	...	...	...	...	...	...	...	...	...	...	1	3	...	...	...	4
	17	...	...	1	1	...	3	11	2	15	...	...	...	...	...	...	...	...	33
	18	...	1	...	2	2	...	6	5	23	27	...	24	...	...	...	1	...	91
	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Blackley	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Harpurhey	20	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1
	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	22	...	...	...	...	...	...	8	...	...	20	...	...	...	6	2	9	...	45
	23	...	...	...	...	...	...	6	...	...	...	...	4	...	...	...	...	...	10
Beswick	24	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	...	...	8
Bradford	24	...	...	...	...	...	...	2	...	...	...	...	...	...	...	4	...	...	6
	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	26	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	1	...	4
Ardwick	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
West Gorton	27	...	...	...	...	...	...	...	...	...	...	...	2	...	...	1	...	...	3
	28	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	4
Totals		8	30	49	65	60	83	102	122	103	119	118	80	35	47	62	32	...	1115

In another direction some progress has recently been made, viz., in the conversion of middens into water-closets. It is much to be regretted that this change has been so slow. But it may be hoped that some acceleration will take place.

Besides the ordinary routine improvements, which I should put first in order of importance when carried out on an adequate scale, the Corporation have made progress in two other ways.

One of these is the clearing of insanitary areas, and the provision of good houses on the sites cleared.

The following is a summary of the provision made :—

Area	Date Condemned	Contents Square Yards	Houses Demolished	Persons Displaced	Date Dwellings and House opened
Oldham Road (1 and 2) ...	Oct. 2nd, 1889	18269	239	1250	Feb. 1899, No. 1 July 30th, 1894, No 2
Pollard Street ...	Oct. 2nd, 1889	5474	99	396	July 16th, 1894
Lord Street......	Oct. 25th, 1889	1073	26	104	Open space
Love Lane	Oct. 25th, 1889	1583	30	120	Open space
Pryme Street ...	1889	2158	33	132	Open space
Allum Street ...	July 23rd, 1889	256	27	108	Open space
Pleasant Place...	1894	316			Open space
Garden Street...	1889	109			Open space
Chester Street...	Jan. 7th, 1891	5671	133	368	April, 1899
Pott Street......	Jan. 7th, 1891	5819	127	399	April, 1899
Harrison Street.	1891	3442	79	250	Oct. 23rd, 1899

Area	Single Tenements	Two-room Tenements	Three-room Tenements	Five-room Tenements	Shops	Accommodates
Oldham Road Dwellings—Area No. 2—5 Stories ...	48	237	...	...	19	848
Oldham Road—Area No. 1—Tenement Houses ...	16	32	16	18	13	425
Pollard Street Area	5	130	...	...	...	448
Harrison Street Lodging-house for Men	...	...	...	...	...	363
Chester Street Area	...	36	36	...	...	324
Pott Street Area	...	36	42	...	2	321

Where an area is inhabited fairly continuously, and individual alterations are inadequate to deal with the conditions inimical to health which affect all the houses in the area, no other course is open except to condemn the area and to devise a scheme for the better housing of the persons displaced.

It is doubtful how far this policy should be pursued on sites the ground of which is so valuable that it is impossible for the improvement schemes to pay their way, that is to say, so far as concerns rebuilding on the area dealt with.

As far as possible, such schemes should lie outside that portion of the Central district which is likely to be needed for business premises within a long period of years.

At a certain point in the history of the City there is usually no great hardship involved in the condemnation of unhealthy dwellings within the business circle, and what is needed within this district is the condemnation of individual unhealthy dwellings and their removal, so that the space may be made available for business purposes, or, if the course preferred is to deal with areas, to make, so far as permitted, the statutory provision of new houses elsewhere than on the area cleared.

It has been contended that by condemning houses singly or in small groups, now here, now there, the Sanitary Committee are increasing the evil of overcrowding. That would doubtless be so if the new houses built for workpeople in or near one or another part of the City did not exceed materially the number required to keep pace with the growth of the population. Tables are now given in this report year by year showing the number of houses newly occupied, from which we perceive that in fact building did some years back outstrip any possible growth of the population. A general diminution in the number of new houses has now set in. Some years ago, also, it was observed that scarcely an empty house could be found, while now there is a considerable number.

It is believed that a double tendency is thus manifested, viz.: (1) There is a growing desire on the part of the well-to-do workpeople to live on the outskirts of the City, where they and their families can enjoy better homes and better health. (2) With the occupation of the large number of new houses provided in recent years, the process of adjustment on which Alderman Walton Smith has insisted has had time to assert itself, and the strain on house accommodation has relaxed.

The number of persons who are absolutely obliged by the character of their work to live in its immediate neighbourhood is, in Manchester, not a large one as compared with the number in some other large cities such as London and Liverpool. So great a provision, therefore, for this class of workpeople is not necessary, and the desire to move outwards to new and better houses can assert itself more freely.

These observations are illustrated by the following tables, showing (A) the number of new houses certified as fit for human habitation year by year in Manchester, and also the distribution of these houses in districts.

A.—STATEMENT AS TO THE NUMBER OF DWELLING-HOUSES CERTIFIED AS FIT FOR HUMAN HABITATION IN THE VARIOUS DIVISIONS OF THE CITY BETWEEN 1890 AND 1901.

DISTRICT	1st Nov., 1890, to 31st Oct., 1891	1891 to 1892	1892 to 1893	1893 to 1894	1894 to 1895	1895 to 1896	1896 to 1897	1897 to 1898	1898 to 1899	1899 to 1900	1900 to 1901	TOTALS
Ancoats	31	195	54	70	7	97	113	53	25	28	33	706
Central	NOTE:—193 Artisans' Dwellings	...	...	...	...	...	...	...	...	...	...	193
St. George's...												
Cheetham ...	8	38	76	97	37	155	269	370	315	128	253	1,746
Crumpsall ...	17	7	18	24	44	39	37	41	18	102	53	400
Blackley	29	11	13	5	19	41	31	56	67	58	33	363
Harpurhey ...	55	60	60	170	191	342	253	346	327	169	129	2,102
Moston	22	12	74	89	148	193	225	263	248	282	179	1,735
Newton	40	20	10	30	65	140	96	136	134	110	90	871
Bradford	36	39	49	21	65	67	198	91	103	198	47	914
Beswick	2	8	15	8	...	97	118	128	98	119	175	768
Clayton	6	61	6	9	39	111	152	161	229	234	164	1,172
Ardwick	4	34	25	59	177	261	192	295	361	145	110	1,663
Openshaw ...	177	169	65	15	60	69	71	152	119	182	80	1,159
Gorton	178	110	30	2	2	20	87	236	178	57	...	900
Rusholme ...	51	37	76	89	211	277	294	354	486	462	288	2,625
C.-on-M.	26	97	97	88	18	36	46	57	1	32	48	546
Hulme.........	...	2	1	1	...	29	24	4	3	2	4	70
City Totals ...	682	1,093	669	777	1,083	1,974	2,206	2,743	2,712	2,308	1,686	17,933

The following table (B) shows the numbers of new houses occupied in 1901 in adjoining districts, which I am enabled to give by the courtesy of the Medical Officers of Health of those districts. These are placed side by side with the figures for previous years.

B.—NEW HOUSES CERTIFIED IN OUTSIDE DISTRICTS IN 1901.

DISTRICTS	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901
Salford	...	254	564	454	613	883	872	1268	885	674	818
Eccles	141	164	109	100	118	113	165	219	202	215	215
Stretford	30	43	38	274	356	313	355	340	262	265	320
Urmston	73	45	42	34	80	102	135	88	43	18	21
Withington Urban District Council :											
Withington	23	31	17	50	70	79	162	171	225	169	59
Didsbury	31	42	33	26	79	55	45	66	139	66	37
Burnage	...	...	26	21	...	1	24	13	1	14	14
Chorlton-cum-Hardy	81	63	10	37	94	155	182	152	55	191	220
Moss Side	...	...	...	...	...	...	...	119	35	403	400
Levenshulme	...	...	...	...	...	...	...	224	290	420	180
Droylsden	...	...	...	...	...	...	...	126	36	41	43
Gorton	...	...	...	...	...	...	...	397	411	352	353
Totals	379	632	839	996	1410	1701	1940	3183	2584	2828	2680

There can be no doubt that the outward tendency of the workpeople above mentioned has been considerably stimulated by the prospect of an excellent service of electric trams, and that the actual presence of these will act even more powerfully in the same direction. If it should be found possible to reduce the tram fares, the movement outwards would probably become very marked indeed.

It was probably their confidence in these results that moved the Chairman and Deputy-Chairman of the Sanitary Committee to take action for acquiring the Blackley Estate, on the northern border of the City, as a site on which houses could be erected to receive the persons displaced by their operations, and also by the operation of improvement schemes.

This estate comprises 237 acres, 187 of which are devoted to housing purposes and 50 to allotments. The first houses to be erected are required for persons displaced by an improvement scheme, and the plans of these have been prepared by the City Surveyor. In a report from the Housing Sub-Committee to the Sanitary Committee is given a scheme showing the provision which it is proposed to make for persons displaced by an improvement scheme. This provision is various in character, so that an opportunity may be given to determine what class of house is most sought after. But this scheme, important as it is, is only preliminary to the general provision to be made on the estate for persons displaced by the operations of the Sanitary Committee, operations which are again rendered possible by a relaxation in the pressure for house accommodation in the City.

These observations may be thus summarised :—

The apparent increase in poverty should inspire the utmost concern, and calls for an inquiry into its causes. If this should appear to be temporary, still the facts and causes of poverty need further investigation in relation to housing.

A house-to-house inspection and register is required, particularly for some parts of the City, so that the conditions requiring attention may be recorded and dealt with.

The Statutes dealing with insanitary dwellings, overcrowding, and other conditions gravely affecting health should be strenuously and steadily enforced. Particular stress must be laid on the maintenance of cleanliness.

The clearing of insanitary areas, and the provision of better dwellings, though an important, is not in Manchester the most important duty of the Sanitary Authority. Such dwellings should be kept outside what may be called the business area. The movement of the better-class artizans to the outskirts is receiving, and should receive, the closest attention and the utmost encouragement, both in facility of transit and in the search for a good class of dwelling.

If any higher standard of housing is to be attained, it appears to me that it is in no small measure by piecemeal work and attention to details, pursued systematically by means of competent agents, that it is to be reached.

This observation applies no less to new houses than to old ones.

WORK OF THE LADIES' PUBLIC HEALTH SOCIETY AND THE LADIES' SOCIETY FOR VISITING THE JEWISH POOR.

The following table shows the amount of work these Societies have done during the year 1901 :—

Work of Female Health Visitors, Year ending 31st December, 1901.

(*a*) Ladies' Public Health Society.

DISTRICT	Number of Cottages in District	Houses Visited		Condition of Houses							No. of Houses containing Lodgers	Complaints requiring action by Sanitary Department	Sickness			Leaflets left at Houses	Disinfecting Powder left at Houses	Limewashing								Reports as to Children being Neglected (clothing, food, &c.)	Help Rendered	Death Cards	Average Death-rate
		First Visit	Not First	Dilapidated	Not Dilapidated	Clean	Dirty	Improved since last Visit	Not Improved	Overcrowded			Infectious	Non-Infectious	Total Sickness			Living and Bed Rooms	Kitchens	Yards	Closets	Cellars	Coal-places	Ceilings	Staircases		Help rendered includes :—Giving food, clothing, &c., advising mothers as to care and treatment of children, making of sick beds, cleaning houses for sick persons, obtaining recommends for Convalescents, &c.		
1. Ancoats, West	1434	...	1872	17	1855	1784	88	201	1671	5	191	57	27	616	643	1830	1850	96	44	54	53	8	3	87	19	...	105	99	42·0
2. Ancoats, North	2137	1105	964	77	1992	1843	226	78	883	...	302	43	18	332	350	2163	1971	42	37	59	49	14	1	76	6	12	117	123	30·7
3. Ancoats, Central	1021	...	1687	45	1642	1534	153	447	1240	2	28	41	47	385	432	1704	1652	186	87	144	143	32	3	136	18	9	301	78	39·2
4. Ancoats, South	1398	...	1849	32	1817	1240	609	443	1406	9	278	77	14	332	346	2035	1825	126	222	306	306	38	102	137	35	62	287	106	32·7
5. Ancoats, East	1166	517	1350	9	1858	1815	52	195	1155	...	57	30	7	92	99	1974	1861	30	23	23	16	1	1	3	1	2	75	70	29·2
6. London Road	1820	...	2069	276	1793	1807	262	853	1216	7	435	106	39	467	506	3507	1868	283	132	360	350	52	47	422	35	38	192	101	34·0
7. Deansgate	1705	...	1998	66	1932	1365	633	472	1526	9	285	86	9	342	351	2023	1794	361	128	176	174	16	57	93	84	10	176	105	35·3
8. St. George's, North	3052	...	2031	9	2022	1935	96	268	1763	4	266	53	14	327	341	2241	1852	40	34	28	29	...	3	27	6	17	143	90	26·8
9. St. George's, East	1421	...	2289	31	2258	2238	51	395	1894	...	115	62	22	185	207	2280	2267	45	209	29	29	6	8	14	1	1	164	159	25·1
10. St. George's, Central	1422	...	1557	211	1346	1389	168	164	1393	12	400	134	24	378	402	2084	1504	253	45	30	37	17	4	187	88	52	177	60	39·2
11. Angel Meadow	1023	352	1760	53	2059	1588	524	150	1610	3	523	72	5	196	201	2176	2107	218	19	21	...	1	...	146	...	2	241	35	50·9
12. Chorlton-upon-Medlock, North.	1808	...	2081	3	2078	1922	159	446	1595	1	296	35	28	331	359	3593	1932	130	83	115	114	23	17	190	34	4	345	134	32·9
13. Chorlton-upon-Medlock, South.	893	...	1946	15	1931	1626	320	404	1542	2	404	64	7	122	129	2158	1869	74	101	139	137	42	4	239	15	33	316	131	25·4
14. Hulme, West	830	...	1160	438	722	1055	105	41	1119	5	488	63	5	301	306	1073	970	138	87	55	44	14	10	145	41	25	153	49	34·7
15. Hulme, Central	3288	273	1301	18	1556	1490	84	144	1157	...	38	48	8	106	114	1562	1556	82	52	75	22	31	2	45	5	1	124	185	28·8
16. Hulme, East	1134	...	1960	32	1928	1431	529	83	1877	5	671	39	17	526	543	1758	1789	138	52	135	134	39	6	225	14	38	326	85	34·8
Total	25552	2247	27874	1332	28789	26062	4059	4784	23047	64	4777	1010	291	5038	5329	34161	28667	2242	1355	1749	1637	334	268	2172	402	306	3242	1610	33·9

(*b*) Ladies' Society for Visiting the Jewish Poor.

DISTRICT	Number of Cottages in District	First Visit	Not First	Dilapidated	Not Dilapidated	Clean	Dirty	Improved since last Visit	Not Improved	Overcrowded	No. of Houses containing Lodgers	Complaints requiring action by Sanitary Department	Infectious	Non-Infectious	Total Sickness	Leaflets left at Houses	Disinfecting Powder left at Houses	Living and Bed Rooms	Kitchens	Yards	Closets	Cellars	Coal-places	Ceilings	Staircases	Reports as to Children being Neglected (clothing, food, &c.)	Help Rendered	Death Cards	Average Death-rate
17. Red Bank	657	...	1170	17	1153	1115	55	69	1101	1	141	128	11	183	194	1045	1046	14	4	13	3	...	...	4	1	...	103	...	17·3
18. Strangeways	394	...	1144	14	1130	962	182	136	1008	...	717	165	10	106	116	1193	1145	6	46	80	66	34	...	9	2	...	38	...	18·5
Total	1051	...	2314	31	2283	2077	237	205	2109	1	858	293	21	289	310	2238	2191	20	50	93	69	34	...	13	3	...	141	...	17·9
Grand Total	26603	2247	30188	1363	31072	28139	4296	4989	25156	65	5635	1303	312	5327	5639	36399	30858	2262	1405	1842	1706	368	268	2185	405	306	3383	1610	...

The work performed by these Societies for a number of years in teaching personal and household cleanliness in the poorer districts of the City has had a marked effect in these districts, and an improvement on former conditions can now generally be discerned. The Medical Officer of Health desires here to acknowledge the valuable services rendered by the Lady Officers and District Lady Superintendents of the Societies in guiding and aiding the work of the Female Health Visitors, and for the sympathy which they manifest in their work amongst the poor. A perusal of the table shows a large record of work.

The Health Visitors have made 32,435 inspections of houses in the course of systematic house-to-house visitation in their respective districts. They have also made 1,610 special enquiries in cases of death, and have laid 1,368 complaints as to insanitary conditions which they have detected in the course of their daily work.

They have distributed no fewer than 36,399 leaflets on the following matters :—

1. The prevention of diarrhœa.
2. The prevention of consumption.
3. Precautions against measles.
4. Precautions against whooping cough.
5. Suggestions to householders.
6. How infants should be fed, etc.

By the distribution of the leaflets and by personal instruction a system of educational work is constantly going on amongst the poor.

Disinfecting powder has been left at 30,858 houses.

Several tons of soap have been sold to the poorer inhabitants, and the importance of cleanliness of their houses and persons is steadily inculcated.

Limewashing.—The visitors supply brushes, on loan, and give the necessary sanitary dry lime to tenants of houses who will undertake cleansing. During the year they have been enabled to get 10,441 rooms, yards, closets, etc., thoroughly cleansed and limewashed. To this portion of their work the Medical Officer of Health attaches great importance.

In the course of their daily visits they came across 306 cases of neglected children. The parents were warned in many instances, and others were reported to the Society for the Prevention of Cruelty to Children.

Help was rendered to 3,383 families in many ways, such as in food and clothing, advising mothers as to the management of their children, making the beds of sick patients and cleaning their houses, obtaining recommends for Convalescent Homes, and in the summer months arranging to send children into the country for a holiday, and to the Manchester Camps for Poor Children at the Seaside.

During the year they have been engaged in another very important work, viz., supervising the disinfection of houses in cases of consumption, and seeing to their subsequent cleansing, and with one or two exceptions this work is carried out to my entire satisfaction. At the end of the year they had 346 cases of consumption under observation in their respective districts. It is their duty to report monthly as to whether the house is clean and free from dust and dirt, and every three months they see that a thorough cleansing of the house takes place, so as to keep down infective material as much as possible, viz., the walls are rubbed down with dough, the floors and furniture washed, and the bed clothing and personal clothing of the patient washed in boiling water.

Special Work in the Jewish Quarter of the City.

About the middle of 1899 the Sanitary Committee decided to appoint a Visitor for special work in the Jewish quarter, about the neighbourhood of Red Bank. The Visitor commenced her duties in August of that year, and has since been steadily at work. The streets which she has visited to the end of the year are—Fernie Street, Cliff Street, Winter Street, Davison Street, Verdon Street, Back Verdon Street, Scotland, Scotland Court, Park Street, Clarissa Place, Lord Street (Red Bank), Lord Street (Cheetham), all in the vicinity of Red Bank; and also Whitfield Street, Robert Street, Pimblett Street, Berkeley Street, Langston Street, Boundary Street, Nightingale Street, Moreton Street, Mary Street, Carter Street, Melbourne Place, and Frances Street, in the neighbourhood of Strangeways.

A thorough house-to-house inspection has been made, and by far the majority were found in a very dirty condition, dilapidated, and in a bad state of repair generally, with the exception of the houses in Lord Street (Cheetham), Whitfield Street (portion of), Robert Street, Pimblett Street, Boundary Street, Moreton Street, Mary Street, and Carter Street (portion of).

However, by systematic visitation, and showing the tenants of the houses that the Sanitary Authority is determined to make an impression on the area, a decided improvement has taken place. The houses are now kept much cleaner, the walls of living-rooms and bedrooms have been repapered; ceilings, yards, cellars, privies, etc., limewashed; defects in roofs, walls, etc., remedied; and the drains, in many instances, reconstructed. Through repeated visits being made, the personal and household improvement is maintained, and a great improvement is visible over the area.

The Unhealthy Dwellings Sub-Committee have also been at work, and the houses in Scotland, Back Scotland, and Park Street are now completed and again occupied, these being converted into through houses, with yards and water-closets provided. There are also five houses in Cliff Street and one in Winter Street which have been similarly dealt with, and are now again occupied. In addition, the Committee have condemned the houses in Verdon Street, and have inspected and certified the houses in Back Verdon Street and Scotland Court, with a view to reconstruction. The alterations are now in progress in Back Verdon Street and Scotland Court.

MONSALL HOSPITAL.

Report on the Monsall Hospital for 1901 by Dr. R. W. Marsden and Dr. A. K. Gordon.

The past 12 months have been remarkable for the amount of work thrown upon the hospital staff, the number of patients admitted being largely in excess of any previous year. Thus, no less than 3,535 cases were treated, the previous record being 2,957 in 1900. This unusual number of cases was due not only to the increased prevalence of Scarlatina, but also to the admission of a larger number of cases of Diphtheria and Erysipelas, as well as to the occurrence of an epidemic of Typhus Fever.

The mortality for Scarlatina is practically identical with that for the year 1900. It is, of course, well known that the mortality from this disease is liable to considerable variations, but a glance at the last table will show that for the past three years this has been consistently low. During this period the patients have been treated in the severer cases by means of repeated tepid baths, and I think the improved mortality is to a certain extent dependent on this fact. Excluding malignant cases, which may be met with at any age, the most fatal type of case is seen in younger children, with severe inflammation in the throat and adjoining parts, succeeded by various septic complications. It is especially in such instances that the beneficent tonic effect of repeated bathing is manifested, since the strength of the patient is maintained in a remarkable manner, thus enabling him to cope more effectually with the long-standing drain upon his vitality. In certain instances these cases have been treated by baths for periods of three, four, and even five weeks, the temperature of the water varying from 90–95° F., and despite the consequent periodical chilling of the surface, which is thus continued into, and even during, the time when Nephritis is likely to manifest itself, this complication in these patients has been remarkably absent.

The next item calling for remark is the increase in the number of cases of Diphtheria admitted, there being no less than 284 cases, as compared with 187 during 1900. Of the necessity that this entails for the provision of increased accommodation for this disease, I have already spoken in previous reports. Unfortunately, one finds that the mortality has also increased from 18·7 in 1900 to 23·9 in the past 12 months. It is only right to note, however, that out of a total number of 68 deaths, no less than 23 occurred within 48 hours of admission. It is manifest, then, that these cases are received too late to expect any beneficial effect from the special treatment adopted, so that a truer comparison as regards the hospital treatment is to be obtained by subtracting such cases from the total in each year. The figures then become 13·14 for 1900, and 17·24 for 1901. In my last report I congratulated the profession generally upon the improvement in the death-rate from Diphtheria, which seemed to be to a certain extent due to the earlier admission of the patients into the hospital, and before irreparable damage had been done. It would therefore seem that my remarks were premature, and I must again draw attention to the necessity of either administering antitoxin at home at the earliest opportunity, or of immediately having the patient removed to hospital as soon as the diagnosis is made.

The only other feature calling for remark is the epidemic of Typhus Fever, in which the increased mortality with advancing years will be manifest, culminating in a death-rate of 100 per cent. for the two cases over 40 years of age. It is satisfactory to look back upon this epidemic from the point of view of hospital management, since I am pleased to be able to state that no official connected with the staff contracted the disease. It is well known that Typhus Fever is highly infectious, and that it has in the past claimed a large number of victims from the medical and nursing professions. The fortunate absence of illness during this epidemic I attribute to the fact that thorough ventilation was maintained throughout, the windows on the leeward side of the building being kept constantly open, even though the cases were admitted in the early part of the year.

R. W. MARSDEN.

STATISTICAL REPORT FOR THE YEAR 1901.

Remaining in Hospital January 1st, 1901	523
Patients Admitted during 1901	3535
	4058

Discharged.

Cured and Died	3591
Remaining in Hospital December 31st, 1901	467
	4058

Total number of Deaths during 1901	253
Net Mortality	7.15°/o

Of the deaths, 54 occured within 48 hours of admission.

Daily Averages.

Patients	492·5
Nurses and Servants	155·1
Officers	6·3
Daily average stay, in days	50·3

TABLE SHOWING MONTHLY DISTRIBUTION OF PRINCIPAL DISEASES ADMITTED THROUGHOUT THE YEAR.

1901	Scarlatina	Diphtheria	Enteric Fever	Morbilli	Pneumonia	Erysipelas	Typhus Fever	Unclassified	Total	Daily Average Number of Patients in Hospital
January ...	225	28	4	1	4	1	19	15	297	496·9
February..	157	37	7	3	1	4	11	18	238	483·9
March ...	143	17	5	2	3	2	0	23	195	465·9
April	146	17	8	2	2	3	1	18	197	375·9
May	230	23	7	12	6	3	0	43	324	379·0
June	281	23	10	4	5	5	0	41	369	508·8
July	267	35	6	7	5	5	0	24	349	549·9
August ...	221	13	24	0	1	7	0	26	292	509·5
September	263	23	49	1	1	12	0	29	378	508·9
October...	260	26	44	6	5	7	0	26	374	571·4
November	192	26	36	7	1	10	0	21	293	566·4
December.	188	16	8	2	0	4	0	11	229	493·6
Total	2573	284	208	47	34	63	31	295	3535	492·5

TABLE SHOWING NUMBER OF VARIOUS DISEASES.

DISEASE	Remaining in Hospital, Jan. 1st, 1901	Admitted to Dec. 31st, 1901	Dismissed, Cured, and Died During 1901	Remaining in Hospital, Dec. 31st, 1901
Scarlatina	457	2573	2602	428
Diphtheria	18	284	274	28
Enteric Fever...............	31	208	207	32
Morbilli	2	47	45	4
Pneumonia	1	34	35	0
Erysipelas	1	63	62	2
Typhus Fever...............	0	31	31	0
Unclassified	13	295	302	6
Total...	523	3535	3558	500

SCARLATINA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Admitted	Died	Mortality per cent.	Admitted	Died	Mortality per cent	Admitted	Died	Mortality per cent.
Under one year...	10	3	30·0	10	1	10·0	20	4	20·0
1 to 2 years...	27	4	14·8	30	7	23·3	57	11	19·2
2 to 3 „ ...	57	11	19·2	53	6	11·5	110	17	16·3
3 to 4 „ ...	100	15	15·0	93	14	15·0	193	29	15·0
4 to 5 „ ...	110	7	6·3	140	9	6·4	250	16	6·4
5 to 10 „ ...	552	18	3·2	568	18	3·0	1120	36	3·2
10 to 15 „ ...	246	2	0·8	275	4	1·4	521	6	1·1
15 to 20 „ ...	88	1	1·1	70	...	...	158	1	0·6
20 to 25 „ ...	30	...	...	43	...	...	73	...	...
25 to 30 „ ...	14	...	...	22	...	...	36	...	...
Over 30 „ ...	11	...	...	24	1	4·1	35	1	2·8
Total	1245	61	4·8	1328	60	4·5	2573	121	4·7

Nineteen deaths occurred within 48 hours of admission.

PERCENTAGE COMPLICATIONS DURING SCARLATINA.

AGE OF PATIENTS	Albuminoid	Hæmorrhage Nephritis	Nephritis	Otitis	Adenitis	Synovitis	Scarlatina Anginosa	Rhinitis
Under one year	...	...	...	35·0	10·0	...	...	50·0
1 to 2 years	1·7	...	...	46·9	4·0	...	4·0	73·4
2 to 3 „	...	2·0	2·0	35·4	14·5	...	1·8	58·1
3 to 4 „	3·7	3·2	3·2	26·4	10·3	2·1	4·1	54·8
4 to 5 „	1·2	2·4	3·6	26·6	7·9	2·5	0·4	50·4
5 to 10 „	1·2	3·2	3·3	21·3	7·6	1·8	0·4	36·4
10 to 15 „	0·7	2·1	3·4	8·6	3·8	4·4	0·2	21·9
15 to 20 „	3·2	1·9	3·2	4·4	5·1	5·6	...	13·3
20 to 25 „	2·6	5·3	...	2·6	1·3	8·0	...	10·6
25 to 30 „	5·5	...	...	8·3	5·5	16·6	...	2·7
Over 30 „	5·7	...	...	...	...	8·5	...	...

ENTERIC FEVER.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Admitted	Died	Mortality percent.	Admitted	Died	Mortality percent.	Admitted	Died	Mortality per cent
Under one year...	...	...	...	...	...	...	...	...	...
1 to 2 years...	...	...	...	...	...	...	...	...	...
2 to 3 ,, ...	1	...	...	...	...	...	1	...	...
3 to 4 ,, ...	2	...	...	1	...	...	3	...	...
4 to 5 ,, ...	2	...	...	1	...	...	3	...	...
5 to 10 ,, ...	12	1	8·3	7	...	...	19	1	5·2
10 to 15 ,, ..	20	1	5·0	15	...	...	35	1	2·8
15 to 20 ,, ...	21	6	28·5	16	2	12·5	37	8	21·6
20 to 25 ,, ...	22	5	22·7	16	4	25·0	38	9	21·0
25 to 30 ,, ...	18	4	22·2	13	1	7·6	31	5	16·1
30 to 35 ,, ...	11	...	...	7	1	14·2	18	1	5·5
35 to 40 ,, ...	3	...	...	6	1	16·6	9	1	11·1
40 to 45 ,, ...	6	2	33·3	3	...	...	9	2	22·2
45 to 50 ,, ...	1	...	...	...	...	...	1	...	...
Over 50 ,, ...	...	...	...	4	1	25·0	4	1	25·0
Total...	119	19	15·9	89	10	11·2	208	29	13·9

Three deaths occurred within 48 hours of admission.

PERCENTAGE COMPLICATIONS DURING ENTERIC FEVER.

AGE OF PATIENTS	Diarrhœa	Constipation	Bronchitis	Pneumonia	Relapse	Intestinal Hæmorrhage	Perforation	Neuritis	Cystitis
Under 1 year	...	...	...	...	...	...	...	...	...
1 to 2 years	...	...	...	...	...	...	...	...	...
2 to 3 ,, ...	100·0	...	100·0	...	...	...	...	...	...
3 to 4 ,, ...	33·3	...	33·3	...	...	...	...	...	...
4 to 5 ,, ...	...	33·3	...	...	...	...	...	...	...
5 to 10 ,, ...	15·8	15·8	15·8	5·2	10·5	5·2	...	15·8	...
10 to 15 ,, ...	8·5	14·2	28·5	2·8	11·4	...	2·8	...	...
15 to 20 ,, ...	...	8·1	24·3	2·7	...	5·4	2·7	2·7	...
20 to 25 ,, ...	...	5·2	10·5	5·2	7·8	10·5	5·2	...	...
25 to 30 ,, ...	9·6	22·5	25·8	...	16·1	3·2	3·2	...	3·2
30 to 35 ,, ...	5·5	11·1	16·6	...	5·5	5·5	...	5·5	...
35 to 40 ,, ...	22·2	...	22·2	...	22·2	22·2	...	...	...
Over 40 ,, ...	7·1	14·2	7·1	...	...	14·2	...	...	...

DIPHTHERIA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality percent.	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent.
Under 1 year ...	3	...	...	5	3	60·0	8	3	37·5
1 to 2 years ...	6	3	50·0	4	1	25·0	10	4	40·0
2 ,, 3 ,, ...	11	5	45·4	11	6	54·5	22	11	50·0
3 ,, 4 ,, ...	12	5	41·6	21	5	23·8	33	10	30·3
4 ,, 5 ,, ...	16	4	25·0	14	3	21·4	30	7	23·3
5 ,, 10 ,, ...	43	9	20·9	68	21	30·8	111	30	27·0
10 ,, 15 ,, ...	12	...	...	13	...	...	25	...	...
15 ,, 20 ,, ...	5	...	...	9	1	11·1	14	1	7·1
20 ,, 25 ,, ...	4	1	25·0	6	1	16·6	10	2	20·0
25 ,, 30 ,, ...	4	...	...	7	...	...	11	...	...
Over 30 years ...	4	...	...	6	...	...	10	...	...
Total	120	27	22·5	164	41	25·0	284	68	23·9

Twenty-three died within 48 hours of admission.

TRACHEOTOMY CASES.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Cases	Died	Mor-tality per cent.	Cases	Died	Mor-tality per cent.	Cases	Died	Mor-tality per cent.
Under 1 year......	1	...	...	...	...	...	1	...	...
1 to 2 years ...	...	...	...	2	...	...	2	...	...
2 to 3 ,, ...	2	1	50·0	3	2	66·6	5	3	60·0
3 to 4 ,, ...	4	2	50·0	5	2	40·0	9	4	44·4
4 to 5 ,, ...	3	3	100·0	1	...	...	4	3	75·0
5 to 10 ,, ...	2	1	50·0	3	1	33·3	5	2	40·0
10 to 15 ,, ...	1	...	...	...	...	...	1	...	...
15 to 20 ,, ...	...	...	...	...	...	...	...	...	...
20 to 25 ,, ...	...	...	...	...	...	...	...	...	...
Over 25 years......	...	...	...	...	...	...	...	...	...
Total...	13	7	53·8	14	5	35·7	27	12	44·4

PNEUMONIA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted.	Died.	Mortality per cent.	Ad-mitted.	Died.	Mortality per cent.	Ad-mitted.	Died.	Mortality per cent.
Under 5 years ...	3	...	...	1	1	100·0	4	1	25·0
5 to 10 „ ...	1	...	...	1	...	...	2	...	...
10 to 15 „ ...	2	...	...	1	...	...	3	...	...
15 to 20 „ ...	10	2	20·0	2	...	...	12	2	16·6
20 to 25 „ ...	2	...	...	2	...	...	4	...	...
25 to 30 „ ...	2	...	...	1	1	100·0	3	1	33·3
30 to 35 „ ...	1	1	100·0	...	...	...	1	1	100·0
35 to 40 „ ...	...	...	...	...	...	...	...	...	...
40 to 45 „ ...	2	2	100·0	...	...	...	2	2	100·0
45 to 50 „ ...	1	...	...	...	...	...	1	...	...
Over 50 „ ...	1	...	...	1	1	100·0	2	1	50·0
Total ...	25	5	20·0	9	3	33·3	34	8	23·5

Two deaths occurred within 48 hours of admission.

TYPHUS FEVER.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mortality per cent.	Ad-mitted	Died	Mortality per cent.	Ad-mitted	Died	Mortality per cent.
1 to 2 years ...	...	...	...	...	...	...	...	...	...
2 to 3 „ ...	1	...	...	...	...	...	1	...	...
3 to 4 „ ...	1	...	...	...	...	...	1	...	...
4 to 5 „ ...	...	...	...	1	...	...	1	...	...
5 to 10 „ ...	2	1	50·0	4	...	...	6	1	16·6
10 to 15 „ ...	1	...	...	4	...	...	5	...	...
15 to 20 „ ...	1	...	...	2	...	...	3	...	...
20 to 25 „ ...	3	1	33·3	2	...	...	5	1	20·0
25 to 30 „ ...	1	...	...	3	...	...	4	...	...
30 to 35 „ ...	...	...	...	...	...	...	...	...	...
35 to 40 „ ...	1	1	100·0	2	1	50·0	3	2	66·6
Over 40 „ ...	...	...	...	2	2	100·0	2	2	100·0
Total...	11	3	27·0	20	3	15·0	31	6	19·3

MORBILLI.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent.
Under 1 year......	...	...	...	1	...	...	1	...	...
1 to 2 years ...	4	...	...	1	1	100·0	5	1	20·0
2 to 3 „ ...	5	1	20·0	3	...	...	8	1	12·5
3 to 4 „ ...	3	1	33·3	4	1	25·0	7	2	28·5
4 to 5 „ ...	5	2	40·0	3	...	...	8	2	25·0
5 to 10 „ ...	5	...	...	9	...	...	14	...	...
10 to 15 „ ...	...	...	...	2	...	...	2	...	...
15 to 20 „ ...	...	...	...	...	...	...	...	...	...
20 to 25 „ ...	...	...	...	2	...	...	2	...	...
25 to 30 „ ...	...	...	...	...	...	...	...	...	...
Total...	22	4	18·1	25	2	8·0	47	6	12·7

Four deaths occurred within 48 hours of admission.

ERYSIPELAS.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent.
Under 5 years ...	1	...	...	...	...	...	1	...	...
5 to 10 „ ...	...	...	...	1	...	...	1	...	...
10 to 15 „ ...	...	...	...	1	...	...	1	...	...
15 to 20 „ ...	4	...	...	6	...	...	10	...	...
20 to 25 „ ...	5	...	...	4	...	...	9	...	...
25 to 30 „ ...	1	...	...	4	...	...	5	...	...
30 to 35 „ ...	5	...	...	2	1	50·0	7	1	14·2
35 to 40 „ ...	4	...	...	4	...	...	8	...	...
40 to 45 „ ...	3	...	...	1	...	...	4	...	...
45 to 50 „ ...	5	...	...	3	...	...	8	...	...
Over 50 „ ...	3	1	33·3	6	...	...	9	1	11·1
Total...	31	1	3·2	32	1	3·1	63	2	3·1

Unclassified.

Disease	Male	Female	Disease	Male	Female
Hæmorrhagic Neph..	...	1	Brought forward...	41	62
Septic Throat	2	2	Synovitis, Left Wrist..	1	...
Puerperal Fever	...	12	Abscess	1	...
Influenza	...	1	Gum Boil	...	1
Empyema	2	1	Œdematous Laryngitis	1	...
Rötheln	17	11	Appendicitis	...	1
Bronchitis	2	3	Ulcer of Leg	...	1
Gangrenous Append..	...	1	Syphilis	1	...
Ulcers	1	...	Broncho Pneumonia..	...	1
Tonsillitis	2	11	Suppur. Epiphysitis...	...	1
Pleurisy	...	1	Abscess of Liver	1	...
Urticaria	...	3	Right Hip Joint Dis..	...	1
Neurasthenia	...	1	Ulcerative Endocardit.	...	1
Burn	...	2	Stomatitis	...	2
Phthisis	2	2	Sub Acute Rheumat..	1	...
Varicella	1	2	Spasmodic Laryngitis	2	...
Periostitis Left Femur.	1	...	Acute Pemphigus ...	...	1
Nephritis	...	2	Septic Wound	1	...
Eczema	...	1	Cereb. Spinal Mening.	1	...
Pertussis	1	1	Meningitis	1	...
Dentition	...	1	Urethritis..............	1	...
Erythema..............	5	1	Otitis Media (Septic.)	...	1
Cellulitis	5	2			
Carried forward......	41	62	Total	53	73

Patients with no stated illness 169
Patients unclassified 126

Total........... 295

Patients cured 282
Patients died (4 male and 9 female) 13

Total........... 295

Net Mortality on Unclassified Cases .... 4·4 per cent.

Three died within 48 hours of admission.

CASE MORTALITY FOR 1892-1901.

Year			Year		
Year	1892	12·32	Year	1897	8·60
,,	1893	9·36	,,	1898	10·70
,,	1894	7·82	,,	1899	7·11
,,	1895	9·73	,,	1900	6·22
,,	1896	10·60	,,	1901	7·15

Total average Case Mortality for the last ten years—8·96.

YEAR	DISEASE	MORTALITY PER CENT.	YEAR	DISEASE	MORTALITY PER CENT.
1890	Scarlatina	12·2	1890	Enteric fever	16·4
1891	Do.	6·9	1891	Do.	19·1
1892	Do.	9·1	1892	Do.	19·1
1893	Do.	6·9	1893	Do.	18·6
1894	Do.	4·4	1894	Do.	15·9
1895	Do.	7·1	1895	Do.	20·1
1896	Do.	8·5	1896	Do.	19·6
1897	Do.	6·1	1897	Do.	13·3
1898	Do.	6·7	1898	Do.	16·1
1899	Do.	3·6	1899	Do.	12·3
1900	Do.	4·6	1900	Do.	11·8
1901	Do.	4·7	1901	Do.	13·9

A. K. GORDON.

REPORT BY MR. A. T. ROOK, SUPERINTENDENT OF THE SANITARY DEPARTMENT.

Sanitary Department,
Town Hall, Manchester.

In presenting to the Medical Officer of Health the report of the work transacted in the Sanitary Department for the year ending 30th April, 1901, I beg to state that the City, for inspection and other purposes, is divided into 28 Districts, to each of which one Sanitary Inspector has been assigned.

In addition to these, there is a Superintendent, one Chief Inspector, two Drainage, four Smoke, one Canal Boats and Lodging-house, two Adulteration of Food, six Factory and Workshops Inspectors, including two Female Inspectors, and two Drain Examiners.

In the House Drainage Department there are also six Clerks of Works for supervising and measuring up work done by the contractors employed by the department in carrying out private drainage work.

The number of complaints of nuisances of various kinds made during the year was 42,408, viz. :—

12,425	through the Medical Officer of Health's Department.
2,045	by the Public.
458	through the Police.
27,480	by the Staff.

HOUSES LET IN LODGINGS.

Under the powers given by section 90 of the Public Health Act, the byelaws made thereunder have been enforced.

The number of houses on the register is 1,344.

To these, 1,989 day visits and 83 night visits have been paid.

Fourteen infringements of the regulations have been reported and dealt with.

Nine visits have also been paid to unregistered houses, the occupiers having previously denied that lodgers were kept.

DAIRIES, MILKSHOPS, AND COWSHEDS REGULATIONS.

Under this Order, which was made in July, 1879, and the Regulations thereunder in 1896, 2,713 milkshops and dairies and 93 cowkeepers are now on the register. The number of cows kept is 1,257. The number of visits to dairies, milkshops, and cowsheds was 1,563. Four cowsheds have been closed as being unfit for use on sanitary grounds.

Many of the cowsheds have been much improved since last year, but there are still many in an unsatisfactory condition, and steps are being taken to improve these.

WORKSHOPS, BAKEHOUSES, SHOP HOURS, AND SEATS FOR SHOP ASSISTANTS ACTS.

During the year the Acts have been well observed, only a few persons having been reported for infringements.

Shop Hours Act. As regards the Shop Hours Act, experience still further confirms the opinion previously expressed that in the absence of a declaration specifying the working hours for each day, as in the case of the Factory and Workshop Acts, it is difficult to produce sufficient evidence to justify prosecutions, the evidence of the young persons in nearly every instance, probably through the influence of their employers, or other reasons, contradicting the signed declarations previously made to the Inspectors.

Workshop Acts.

Great improvements have been effected since the last report in the condition of workshops, many alterations having been made—either after notice or at the request of the Inspectors—to improve the ventilation, lighting, overcrowding, cleansing, and general sanitary conditions.

Special attention has also been given to see that premises are provided with sufficient and satisfactory closet accommodation, this being a common defect in a number of the largest workshops.

In nearly all the cases reported the necessary accommodation has been provided, and others are under notice, and will be dealt with in due course.

Means of escape in case of fire.

With regard to means of escape in case of fire, the whole of the factories and workshops in the City have been inspected, and with very few exceptions are now considered safe.

Periodical changes will, of course, from time to time take place in various ways which will bring buildings within the meaning of the Act, and necessitate the constant supervision of the Inspectors, and action on the part of the authorities.

Bakehouses.

During the year several more of the worst bakehouses in the City have been absolutely closed, and a number of others have been reported by the Medical Officer of Health to be unfit for use until satisfactory alterations are made to place the premises in a better sanitary condition.

Extensive alterations have been made in many of the bakehouses, and a general improvement is manifest throughout the City consequent upon the action taken by the department.

Out-workers.

Many visits have been paid to houses in which out-work is carried on, as will be seen on reference to the following tabulated statement, but constant visitation is necessary to maintain the standard of cleanliness which is to be desired, especially in houses in which shirt-making, handkerchief-hemming, brace-making, and umbrella-covering, etc., is done. This class of work is almost exclusively confined to the poorer people, who live in small houses in the congested parts of the City.

The people, as a rule, appear willing to carry out any suggestion made by the Inspectors to keep their houses clean; but at the same time it is almost impossible for small houses, sometimes containing large families, to be kept in such a satisfactory condition as workshops.

Seats for Shop Assistants Act.

This Act, without the necessity of any legal proceedings, has been complied with by all the shopkeepers of the City.

The work done under the above Acts is shown in the following tables.

Showing the Work done by the Inspectors under the Shop Hours, Seats for Shop Assistants, and Factory and Workshop Acts.

Number of District	INSPECTOR	SHOPS					SHOPS					WORKSHOPS						Number of visits to houses where outworkers are employed	Factories and Workshops not provided with proper means of escape in case of fire	BAKEHOUSES					
		Shop Hours Act					Seats for Shop Assistants Act																		
		Number of visits	Number of Infringements of Act reported	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits	Number of infringements of Act reported	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits	Number in which Sanitary Defects were found	Number of Reports referred to Factory Inspector (unregistered factories, &c.)	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register			Number of visits	Number in which Sanitary defects were found	Number of reports referred to Factory Inspector	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register
a 1	Joseph H. Fowles.	31	...	...	3	912	...	...	...	...	111	2071	252	147	9	257	1135	2	7	259	36	3	3	2	77
2	John Kewley ...	28	8	1	...	608	...	...	...	...	210	2979	239	108	7	258	1029	6	4	842	81	5	1	7	161
3	Ernest Bailey ...	400	...	...	28	649	...	...	...	...	132	2181	163	61	6	146	936	...	...	1128	131	1	...	10	134
4	Francis J. Rowe..	46	1	1	9	713	...	...	...	...	160	3281	221	93	3	180	1090	...	5	874	2	4	...	15	153
...	Emma Coppock..	1299	...	...	113	...	728	...	...	156	...	2865	142	...	...	...	...	516	...	...	...	...	...	...	...
...	Ethel Stewart ...	1708	...	1	108	...	393	...	...	182	...	2270	102	...	...	...	...	616	...	...	...	...	...	...	...
...	TOTALS ...	3512	9	3	261	2882	1121	...	...	338	613	15647	1119	409	25	841	4190	1140	16	3103	250	13	4	34	525

a Inspector Fowles commenced duty November 5th, 1900.

PROSECUTIONS FOR OFFENCES, WITH RESULTS.

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid			Dismissed, Withdrawn, &c.
			£	s.	d.	£	s.	d.	
Christian Schimpf...	Royal Hotel, 2, Mosley Street..	Employing a young person over 74 hours a week	0	5	0	0	5	0	
William Merrill......	408, Stretford Road	Not exhibiting Abstract of Shop Hours Act in his shop	0	10	0	0	8	6	
Esther Beverley ...	93, Ashton Old Road, Ardwick.	Ditto ditto ...	0	5	0	0	5	0	
Julius Jacobson......	126, Red Bank	Having his bakehouse in a dirty state	0	10	0	0	8	6	
Jacob Marcovitch...	7, Broughton Lane..............	Ditto ditto ...	2	0	0	0	8	6	
Simon Rubenstein...	37, Bury New Road	Ditto ditto ...	1	1	0	0	8	6	
Harris Glaskie	5, Adelaide Street	Ditto ditto ...	2	0	0	0	8	6	
Harris Payman	46, Moreton Street	Neglecting to limewash his workshop (after notice)		......		0	3	0	Work done (withdrawn)
James Tracey	3, Marshall Court	Ditto ditto ...		......			......		Ditto
Wm. Hy. Sutton ...	59, Oldham Road	Neglecting to repair defective roof of workshop No. 15, Percival Street, Collyhurst Street, after notice		......			......		Ditto
William Goodall ...	Cornbrook	Ditto 87, Princess Street......		......		0	3	0	Ditto
James Royle	17, Albert Square	Ditto 1, Britannia Street.......	1	0	0	0	8	6	
Wm. Hy. Robinson.	Blackfriars Street	Ditto 11, Hayes Street.........		......		0	3	0	Work done (withdrawn)
Aaron Jones	9, Swan Street....................	Ditto In Back Foundry Street		......			......		Withdrawn
Sarah Higginbottom	Blackburn Street.................	Neglecting to place workshop in a proper sanitary condition after notice		......		0	7	6	Order of Abatement made
Lewis Raynes	1A, Norfolk Street, Cheetham...	Ditto ditto (closets)		......		0	3	0	Work done (withdrawn)
		Carried forward ......£	7	11	0	4	0	6	

PROSECUTIONS FOR OFFENCES, WITH RESULTS—*continued.*

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed			Amount of Costs ordered to be Paid			Dismissed, withdrawn, &c.
			£	s.	d.	£	s.	d.	
		Brought forward………	7	11	0	4	0	6	
John McMerny……	18, 19, 20, Altrincham Street…	Neglecting to place workshop in a proper sanitary condition after notice ……………………(closets)	……			……			Work done (withdrawn)
John Battersby (owner)	16, Albert Square …………	Ditto Cockpit Farm, Blackley	……			……			Ditto
George W. Ainley (occupier)	Cockpit Farm, Blackley……								
John Lonsdale ……	14, Trafalgar Street, Cheetham	Ditto 14, Trafalgar Street……	……			……			Ditto
Richard J. Dowling.	52, Sackville Street …………								
W. H. Sutton ……	59, Oldham Road ……………	Neglecting to place closets of workshop in a proper sanitary condition after notice	……			0	3	0	Ditto
John Balchunas …	97, Portugal Street ,,…………	Neglecting to limewash his workshop after notice	0	10	0	0	8	6	……
Joseph Smith ……	122, Leaf Street, Hulme ……	Ditto ditto …	……			0	3	0	Work done (withdrawn)
William Mannion…	27, Gorton Street ……………	Ditto ditto …	……			0	3	0	Ditto
David Hadden ……	67A, Oxford Street, C.-on-M. …	Ditto ditto …	……			0	3	6	Ditto
Charles Stonier ……	455B, Stockport Road…………	Ditto ditto (closets)	……			……			Dismissed
Joseph Mellor ……	455A, Stockport Road ………	Ditto ditto (closets)	……			……			Ditto
Seth Harris ………	211, Great Jackson Street, Hulme	Ditto ditto (closets)	0	2	6	……			
Thomas Kelsall……	Ditto ditto	Ditto ditto (closets)	0	2	6	……			
Harris Black………	4, Derby Court, Long Millgate.	Ditto ditto …	……			……			Withdrawn (Removed)
		Total……………£	8	6	0	5	1	6	

SMOKE NUISANCES.

For the abatement of smoke nuisances, the four Inspectors appointed specially for this work have taken 1,171 timed observations of half-an-hour each, with the result that 195 notices for the abatement of nuisances have been served. Proceedings before the Magistrates have been ordered in 204 cases out of 277 offences reported. These cases were disposed of as follows :—

Two hundred and twenty-three were summoned before the justices, in 167 of which fines were imposed amounting to £397 7s. 6d., and costs £90 16s. 2d.

One was ordered to pay costs only.

Forty-one orders of abatement were granted and served, 12 cases were excused, dismissed, or withdrawn, and 2 cases were adjourned.

Much attention during the past year, as will be seen by the above, has been given to the nuisance caused by the emission of black smoke, not only from the furnaces connected with boilers in mills, warehouses, and other works, but also from chemical and other industries, and the efforts made have already resulted in a considerable reduction of the nuisance. It may be stated that representations have been made to other Authorities on the North-East and West sides of the City, in regard to the great pollution of the air of the City by the excessive emission of smoke from the chimneys in their districts.

SALE OF FOOD AND DRUGS ACTS AND MARGARINE ACT.

Under these Acts, the two Inspectors specially appointed have purchased for analysis 1,728 samples. Of these, 110 were adulterated, viz. :—

Beer	70
Butter	11
Cheese	3
Coffee	2
Milk	18
Spirits	6

Seventy-five summonses were issued. In 49 cases fines were imposed amounting in the aggregate to £105 15s. 6d., with costs £83 6s. 3d.

Twenty-six summonses were dismissed or withdrawn.

Appended are tables showing the result of the action taken under the Acts since 1873.

Table showing the number of Articles of Food and Drugs procured for Analysis, the number Adulterated, the number informally purchased or in which no proceedings were taken, and the number of cases in which Magisterial Proceedings were taken, together with the Decisions and the Total Amount of Fines imposed from May 1st, 1873, *to April* 30*th*, 1901.

Article	No. Procured	No. Adulterated	No. informally purchased or in which no proceedings were taken	No. Summoned before Magistrates						
				No. Summoned	No. Fined	No. of Warrants granted	No. ordered to pay Costs only—Dismissed or Withdrawn	Total Amount of Fines Imposed		
								£	s.	d.
Arrowroot	6	...	...	...	...	...	...	......		
Bacon	1	...	...	...	...	...	...	......		
Baking Powder	24	...	...	...	...	...	...	......		
Beef Dripping	1	...	...	...	...	...	...	......		
Beer	460	72	34	38	19	...	19	38	0	0
Bread	1025	39	7	32	32	...	...	119	10	0
Butter	1875	323	24	299	238	3	58	423	6	0
Buttermilk	2	2	2	...	...	...	...	......		
Cheese	146	7	4	3	2	...	1	3	10	0
Chicory	42	...	...	...	...	...	...	......		
Cider	3	...	...	...	...	...	...	......		
Cocoa	7	...	...	..	...	...	...	......		
Cod Liver Oil	6	...	...	...	...	...	...	......		
Coffee	488	40	2	38	37	...	1	57	15	6
Confectionery	270	2	...	2	2	...	...	10	0	0
Cream	12	...	...	...	...	...	...	......		
Drugs	320	10	9	1	1	...	...	0	5	0
Fish (tinned)	1	...	...	...	...	...	...	......		
Flour	83	...	...	...	...	...	...	......		
Fruit (tinned)	2	...	...	...	...	...	...	......		
Jams	199	1	...	1	1	...	...	1	0	0
Jelly	2	...	...	...	...	...	...	......		
Ketchup	1	...	...	...	...	...	...	......		
Lard	634	27	5	22	18	...	4	44	3	6
Margarine	39	...	..	...	...	...	...	......		
Meats (tinned)	6	...	...	...	...	...	...	......		
Milk	18749	1425	22	1403	961	..	442	2874	6	0
Milk (skimmed)	147	23	...	23	18	...	5	39	1	6
Milk (condensed)	6	...	...	...	...	...	...	......		
Mineral Waters, &c.	254	79	76	3	...	...	3	......		
Carried forward	24811	2050	185	1865	1329	3	533	3610	17	6

Article	No. Procured	No. Adulterated	No. informally purchased or in which no proceedings were taken	No. Summoned before Magistrates						
				No. Summoned	No. Fined	No. of Warrants granted	No. ordered to pay Costs only—Dismissed or Withdrawn	Total Amount of Fines Imposed		
								£	s.	d.
Brought forward	24811	2050	185	1865	1329	3	533	3610	17	6
Mustard..	286	44	6	38	32	..	6	18	9	0
Oatmeal..................	92	...	...	...	...	...	...	......		
Olive Oil	12	1	...	1	1	...	...	0	2	6
Pepper	512	5	...	5	4	...	1	1	7	6
Pickles	4	...	...	...	...	...	...	......		
Porter	4	...	...	...	...	...	...	......		
Rice, Tapioca, &c.......	97	...	...	...	...	...	...	......		
Spices	200	1	...	1	...	...	1	......		
Spirits	919	41	7	34	31	...	3	61	7	0
Sugar.....................	65	...	...	...	...	...	...	......		
Tea	344	10	7	3	2	...	1	2	0	0
Treacle	19	...	...	...	...	...	...	......		
Tripe	1	...	...	...	...	...	...	......		
Vegetables (tinned) ...	8	2	2	...	...	...	...	......		
Vinegar..................	127	8	...	8	7	...	1	2	10	6
Wines	35	...	...	...	...	...	...	......		
Totals............	27536	2162	207	1955	1406	3	546	3696	14	0

Other Offences against the Acts.

Offence	No. Summoned	No. Fined	No. Dismissed or Withdrawn	Total amount of Fines imposed		
				£	s.	d.
Refusing to serve Inspector with Samples of Food	21	21	...	71	2	6
Giving False Warranty	15	4	11	21	0	0
Obstructing Inspector in the execution of his duty..	1	...	1	......		
Selling Milk from a vehicle which had not the name and address of the person inscribed thereon	1	1	...	0	2	6
Totals......................	38	26	12	£92	5	0

Total amount of Penalties for Adulteration...............	£3,696	14	0
Total amount of Penalties for Other Offences............	92	5	0
Grand Total.........	£3,788	19	0
Total amount of Penalties against Farmers	£1,781	15	0

Showing the number of persons summoned more than once under the Adulteration of Food and Drugs and Margarine Acts from May 1*st*, 1873, *to April* 30*th*, 1901.

MILK DEALERS.

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	In County (Salford)
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Milk.	0 5 0 *8 W*	Withdrawn *10 W*	1 0 0 *16 W*	......	......
2	Do.	10 0 0 *60 F*	10 0 0 *11½ F*	......	......	......
3	Do.	10 0 0 *66 F*	5 0 0 *64 F*	1 0 0 *9½ W*	5 0 0 (*Skimmed Milk*) *8 W*	10 0 0 2 0 0 1 0 0 5 0 0
4	Do.	0 10 0 *6½ W & 5 F*	2 0 0 *9 W*	......	......	......
5	Do.	3 0 0 (Refusing)	10 0 0 *9 W*	5 0 0 *56 F*	......	......
6	Do.	2 0 0 *11 W*	2 cases Withdrawn (Farmer fined) *20 F each*	2 0 0 *10 W & 17 F*	5 0 0 *44 F*	......
7	Do.	2 0 0 *5 W*	Withdrawn *11½ W*	6 0 0 *1½ W & 15 F*	10 0 0 *2 W & 33 F*	......
8	Do.	3 0 0 *10 W & 25 F*	1 0 0 *5 W*	......	......	......
9	Do.	1 1 0 *24 W*	1 1 0 *30 F*	......	......	......
10	Do.	1 0 0 *10 W*	5 0 0 (Refusing)	15 0 0 *30 W*	......	......
11	Do.	2 0 0 (Refusing)	Withdrawn (Farmer fined) *8 F*	2 10 0 *12 W*	5 0 0 *8 W*	......
12	Do.	2 0 0 *10 W*	Withdrawn (Farmer fined) *7 W*	2 0 0 *5 W*	......	......
13	Do.	1 0 0 *40 F*	1 0 0 *7 W*	5 0 0 (Refusing)	......	......
14	Do.	1 1 0 *8½ W*	5 0 0 *14 W*	2 0 0 *12 W*	1 10 0 *8 W*	2 0 0 20 0 0
15	Do.	10 0 0 *20 W*	5 0 0 *13 W*	5 0 0 *10 W*	......	......

The figures in *Italic* denote the percentage of water added and fat abstracted.

FARMERS.

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	5th Offence	6th Offence	7th Offence	8th Offence	9th Offence	10th Offence	In County
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
				Heard same day								
16	Milk	4 0 0 *7 W*	10 0 0 *4½ W*	20 0 0 *10 W*	Dismissed *9½ W*	Dismissed *8 W*	...	...	...	...	...	15 0 0 (Strangeways)
		Heard same day		*Heard same day*								
17	Do.	5 0 0 *12 W*	Costs only *26 W*	Dismissed *4½ W*	Dismissed *6½ W*	3 0 0 *10½ W*	3 0 0 *11½ W*	...	...	...	...	...
18	Do.	10 0 0 *33 F*	2 cases 20 0 0 *28 F* *28 F*	...	...	...	...	...	...	...	...	...
19	Do.	15 0 0 (In 2 cases) *20 F* *20 F*	15 0 0 (In 3 cases) *4½ W* *5 W* *8 W*	...	...	...	...	...	...	...	Hanley, Staffs.	40 0 0 (In 4 cases)
20	Do.	2 cases Dismissed *4 W & 8 W*	Dismissed *10 W*	...	...	...	...	...	...	...	..	2 0 0 Gorton *8 W*
21	Do.	2 0 0 (In 3 cases) *6 W* *4 W* *10 W*	4 0 0 (In 2 cases) *8 F* *13 F*	...	...	...	...	...	...	...	...	...
22	Do.	5 0 0 *7½ W*	2 0 0 (In 2 cases) *28 F* *10 F*	...	...	...	...	...	...	...	...	...
23	Do.	10 0 0 (In 2 cases) *10 W* *4½ W*	1 0 0 (In 4 cases) *16 F* *45 F* *30 F* *31 F*	...	...	...	...	...	...	...	...	...
24	Do.	2 0 0 *8 W*	10 0 0 *10 W*	5 0 0 (Refusing)	...	...	..	...	...	...	...	...
25	Do.	2 0 0 *4½ W*	2 0 0 (In 2 cases) *9½ W* *6 W*	...	...	...	...	...	...	...	...	...
26	Do.	4 0 0 (In 2 cases) *28 F* *33 F*	10 0 0 (In 2 cases) *10 F* *10 W*	...	...	...	...	...	...	...	...	...

The figures in *Italic* denote the percentage of water added and fat abstracted.

FARMERS—*continued*

No.	Article	1st Offence	2nd Offence	3rd Offence	4th Offence	5th Offence	6th Offence	7th Offence	8th Offence	9th Offence	10th Offence	In County
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
27	Milk	15 0 0 *30 W*	20 0 0 *39 W*	10 0 0 (Refusing)	10 0 0 (Refusing)	10 0 0 *14 W*	5 0 0 (Refusing)	20 0 0 *14 W*	20 0 0 *12 W*	10 0 0 *15 W*	10 0 0 *8 W*	20 0 0 (Strangeways)
28	Do.	2 0 0 *12 F*	5 0 0 *4½ W* *15 F*	...	...	...	...	...	...	...	...	...
29	Do.	2 0 0 (In 2 cases) *20 W* *29 W*	2 0 0 *23 W*	...	...	...	...	...	...	...	...	...
30	Do.	4 0 0 (In 2 cases) *7 W* *10 W*	5 0 0 (In 2 cases) *8 W* *8 W*	...	...	...	...	...	...	...	...	...
31	Do.	5 0 0 *20 F*	5 0 0 *13 W*	...	...	...	...	...	...	...	...	...
32	Do.	1 0 0 *10 F*	5 0 0 *20 F*	10 0 0 *6 W*	2 cases 5 0 0 *10 W* *6 W*	5 0 0 *12 F*	2 0 0 *6 W*	...	...	...	...	...
33	Do.	3 0 0 *12½ W*	5 0 0 *8 W*	...	...	...	...	...	...	...	...	...
34	Do.	15 0 0 (In 3 cases) *7 W* *12 W* *11 W*	10 0 0 *20 W*	...	...	...	...	...	...	...	...	...
35	Do.	2 0 0 *10 F*	5 0 0 *11 W*	5 0 0 *11 W*	3 cases 20 0 0 *11 W* *15 W* *15 W*	...	...	...	...	...	Altr'ncham Salford Do.	Dismissed 2 0 0 2 0 0
		Heard same day										
36	Do.	15 0 0 *17 W*	5 0 0 *17 W*	...	...	...	...	...	...	...	Salford L'pool Do.	10 0 0 10 0 0 10 0 0
37	Do.	10 0 0 (In 2 cases) *44 F* *25 F*	5 0 0 *8½ W &* *7 F*	...	...	...	...	...	...	...	...	...
38	Do.	2 cases 5 0 0 5 0 0 *7 W* *10 W*	2 cases 10 0 0 10 0 0 *16 W* *13 W*	...	...	...	...	...	...	...	...	...
39	Do.	2 cases 1 0 0 1 0 0 *17 F* *20 F*	10 0 0 *7 W*	...	...	...	...	...	...	...	...	...

The figures in *Italic* denote the percentage of water added and fat abstracted.

BUTTER CASES.

No.	1st Offence	2nd Offence	3rd Offence	4th Offence
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
40	Costs only July 19th, 1878 (Butterine)	2 0 0 Dec. 7th, 1887 (Butterine)	Withdrawn Jan. 11th, 1893 (Excess Water) *10 per cent.*	Withdrawn Jan. 11th, 1893 (Excess Water) *8½ per cent.*
41	2 0 0 Jan. 13th, 1886 (Butterine)	1 0 0 Dec. 7th, 1887 (Butterine)	....	....
42	2 0 0 April 16th, 1884 (Butterine)	2 0 0 Jan. 15th, 1886 (Butterine)	Costs only Jan. 10th, 1894 (Packet not marked Margarine)	....
43	2 0 0 April 16th, 1884 (Butterine)	3 0 0 Dec. 22nd, 1886 (Butterine)	3 0 0 March 5th, 1890 (Margarine)	3 0 0 March 5th, 1890 (Margarine)
44	2 0 0 May 21st, 1884 (Butterine)	5 0 0 Jan. 13th, 1886 (Butterine)	5 0 0 Dec. 7th, 1887 (Butterine)	....
45	0 10 0 Dec. 7th, 1887 (Butterine)	Dismissed March 14th, 1894 (Excess Water) *6 per cent.*	Dismissed March 14th, 1894 (Excess Water) *5½ per cent.*	....
46	2 0 0 March 31st, 1886 (Butterine)	1 1 0 May 2nd, 1888 (Margarine)	....	....
47	Dismissed April 8th, 1885 (Butterine)	2 0 0 Dec. 7th, 1887 (Butterine)	....	....
48	Do.	Do.	....	....
49	2 0 0 April 16th, 1884 (Butterine)	10 0 0 Nov. 13th, 1889 (Margarine)	....	....
50	1 1 0 Dec. 7th, 1887 (Butterine)	2 0 0 April 17th, 1889 (Margarine)	....	....
51	5 0 0 March 21st, 1888 (Margarine)	Withdrawn Jan. 11th, 1893 (Excess water) *9 per cent.*	....	....
52	0 5 0 March 13th, 1889 (Margarine)	Dismissed Jan. 23rd, 1894 (Excess Water) *11½ per cent.*	....	....
53	0 5 0 Oct. 3rd, 1888 (Margarine)	Dismissed March 14th, 1894 (Excess Water) *7 per cent.*	....	....

The figures in *Italic* denote the percentage of water added and fat abstracted.

Butter Cases—*continued*

No.	1st Offence	2nd Offence	3rd Offence	4th Offence
	£ s. d.	£ s. d.	£ s. d.	
54	1 0 0 Nov. 23rd, 1892 (Margarine)	2 0 0 Oct. 20th, 1897 (Margarine)	5 0 0 March 8th, 1899 (Foreign Fat) *80 per cent.*	....
55	1 0 0 Nov. 21st, 1894 (Margarine)	10 0 0 July 26th, 1899 (Margarine)	....	....
56	2 0 0 April 1st, 1896 (Margarine)	3 0 0 Dec. 1st, 1897 (Margarine)	....	....

The figures in *Italic* denote the percentage of water added and fat abstracted.

CANAL BOATS ACTS.

The number of canal boats on the register is 459.

The number inspected was 1,912, resulting in eleven infringements of the Act being discovered, which were referred to the Justices to be dealt with; in seven cases fines were imposed amounting in the aggregate to £2 2s. 6d., and the costs £2 14s. 2d.; in one case the person was ordered to pay costs only; and three cases were withdrawn.

Sixty-seven caution notices were sent to the owners and masters.

OFFENSIVE TRADES.

The number of offensive trades on the register is 679. These have been placed under close supervision, and periodical visits paid.

UNHEALTHY DWELLINGS.

During the year, 196 houses were certified to be dealt with by the Sanitary Committee.

Of these, 141 were ordered to be closed.

The Notices to close have not been issued, the hands of the Committee having for a time been stayed by the Council. The Committee, however, resumed its operations in July last.

PARTICULARS RELATING TO THE OPERATIONS OF THE CLEANSING DEPARTMENT.

Cleansing Department,
Town Hall, Manchester,
April 15th, 1902.

Dear Sir,—There are within the City, pail-closets, 73,915; ash-boxes, 65,240; midden-privies, 20,532; wet middens, 10,598; dry middens, 740; water-closets, 45,686; and cesspools, 89. The pail-closets are systematically emptied at regular intervals—once, twice, or thrice weekly, as necessity demands. The midden-privies are emptied as required. The contents of the pail-closets are taken to Holt Town and Water Street. At Holt Town the fæcal matter is dried into concentrated manure. The dry refuse is consumed in the Galloway boilers, and generates the steam required for working the machinery. The worthless fine ash, which cannot be consumed, is deposited at the nearest tip at Clayton Vale. The privy refuse and fæcal matter which is taken to Water Street is sent away in its crude state as night-soil to Carrington and Chat Moss Estates and to farmers in Cheshire. Dry combustible matter is passed into the destructor furnaces or under the Galloway boilers at Water Street, and there destroyed. A large quantity of fine ash at Water Street is used as an absorbent for the fæcal matter from the pail-closets.

The market garbage, of which we have 5,104 tons per annum, is carted to Water street, and there either destroyed in the furnaces or loaded into boats and sent away to farmers and Carrington and Chat Moss Estates immediately. Slaughter-house refuse is collected from the abattoirs and private slaughter-houses and sent to Holt Town, where it is passed through dryers, and the dry material is then added to the concentrated manure. Street sweepings are generally deposited at the nearest depot, and after being allowed to drain are carted to the nearest tip, or to the Water Street Depot, from whence they are sent away by boat to farmers or the Committee's Estates.

The total quantity of material collected by this Department during the past year amounted to 366,469 tons.

We have within the City about 48 destructor furnaces of different kinds, and last year 13,240 tons of mortar was made from the clinker which is obtained from such furnaces.

We employ nearly 46 "orderly" youths and men, who collect horse-droppings and litter from the street, and deposit the same in the bins which are fixed in the footpaths. The contents of the bins are removed twice daily, and taken to the nearest depot.

With regard to the removal of the contents of the pails from Typhoid Fever cases: Acting upon instructions we received from you, special pails and lids are supplied for all cases of Enteric Fever; labels are attached to the pails, asking the occupants to use disinfectants, which are supplied with the pails; the pails are left in the yard, and not placed in the ashplace. The occupants of the houses are requested to use this special pail for the reception of the fæcal matter and washings from the patient only. The pails are removed periodically in a specially constructed vehicle, and taken to Holt Town Depot, where the contents are destroyed.

With regard to the cleansing of passages, we have a staff of about 34 men engaged specially upon this work. They regularly, at least once a week, cleanse the back passages in certain districts, and during last year 213,989 swillings and cleansings were effected in courts and passages.

During the year 52,833 barrels of water were used in degging the streets, and 266,059 grids were unstopped.

During the past ten years we have deposited upon the various tips within the City the following quantities of material, viz.:—In 1892, 99,866 tons; 1893, 109,078 tons; 1894, 103,949 tons; 1895, 113,836 tons; 1896, 107,883 tons; 1897, 99,658 tons; 1898, 96,635 tons; 1899, 104,481 tons; 1900, 95,138 tons; 1901, 64,781 tons; and in 1902, 117,619 tons. The bulk of this material was deposited on the tips at Clayton and Harpurhey. It is composed principally of dry ashes, street sweepings, and bell-dust. Occasionally the contents of dry middens are sent there. During last year 21,305 tons of material was sent to Carrington Estate and 60,001 to Chat Moss Estate.

Yours faithfully,

G. Plant,

Superintendent.

Dr Niven,
Medical Officer of Health,
Town Hall, Manchester.

DEPARTMENT OF MEAT INSPECTION.

Dr. Niven,
Medical Officer of Health,
Town Hall.

City Abattoirs,
January 30th, 1902.

Dear Sir,—At your request, I have pleasure in submitting the following report with reference to the work done in the above department, and the amount of unwholesome food dealt with under the Public Health Acts, 1875 and 1890, by this department during the year ending December 31st, 1901 :—

ABATTOIR AND CARCASE MARKET.

The number of animals slaughtered in the Abattoir, Water Street, during the 12 months :—

Cattle	Sheep	Lambs	Calves	Pigs
35,587	108,225	44,332	1,204	14,554

The number of carcases exposed for sale in the Meat Market, Water Street :—

	Beast	Sheep	Lambs	Calves	Pigs
Abattoir killed ...	31,566	97,949	41,665	238	628
Imported Fresh ...	28,395	46,532	517	17,850	13,939
Imported Chilled & Frozen	14,758	178,966	36,720	—	36,108
Total	74,719	323,447	78,902	18,088	50,675

Beast, Sheep, and Pig Offals :—

Imported and exposed in the Meat Market	Fresh	821,600lbs.
	Chilled and Frozen	791,300lbs.

RUSHOLME ABATTOIR.

The number of animals slaughtered at the Abattoir, Monmouth Street, Rusholme :—

Beast	Sheep and Lambs	Calves	Pigs
447	4,613	190	1,971

PRIVATE SLAUGHTER-HOUSES.

The number of private slaughter-houses on our register is 84, of which 68 are attributed to beef and 16 to the pork butchers. Of these numbers, 78 are constantly in use. In the remaining six, little or no slaughtering is done, their occupation being used chiefly for the storage of meat.

There has been one slaughter-house closed by the owner during the past year.

The amount of slaughtering executed in the private slaughter-houses has been approximately estimated in the following figures :—

	Cattle	Sheep and Lambs	Pigs
Beef Butchers	10,462	45,916	400
Pork ,,	—	—	20,000

The amount of unwholesome food condemned during the year :—

Meat and Fish.

Beef	183,240 lbs.
Mutton	4,755 ,,
Veal	1,697 ,,
Venison	7 ,,
Pork	17,167 ,,
Total	206,866 lbs.

Fish	130,773 lbs.
Shellfish	36,030 ,,
Total	166,803 lbs.

Game and Rabbits.

Partridge	359 head
Pheasants	72 ,,
Black Game	92 ,,
Ptarmigan	135 ,,
Quails	132 ,,
Capercailzies Hens	106 ,,
Rooks	424 ,,
Wood Pigeons	89 ,,
Grouse	60 ,,
Curles	22 ,,
Hares	172 ,,
Rabbits	5,304 ,,

Poultry.

Chickens	1,308 head
Ducks	552 ,,
Pigeons	112 ,,
Turkeys	71 ,,
Geese	25 ,,

Fruit.

Bananas	270 cases
Tomatoes	15 boxes
Cherries	446 baskets 146½ sieves
Black Currants	17 ,,
Plums	50½ ,,
Strawberries	129 baskets 21 tubs
Raspberries	62 cases
Gooseberries	29 baskets
Blackberries	5 seives
Damsons	1 basket

Vegetables.

Onions	248 bags 192 cases 32 baskets
Parsnips	40 bags
Turnips	40 ,,
Potatoes	33 ,,
Gherkins	30 ,,
Sprouts	46 baskets
Cauliflowers	17 hampers
Mushrooms	12½ baskets
Lettuce	38 pots
Watercress	8 baskets
Cress	6 boxes 3 flats

Miscellaneous.

Cocoa Nuts	80 bags
Eggs	3 cases

The number of carcases, portions of carcases, and consignments of fish, etc., condemned during the year has been 1,868, and from the following causes :—

Decomposing	1,208	Parasitic	3
Tuberculosis	409	Peritonitis	3
Unmarketable	48	Septic Metritis	3
Emaciation	33	Milk Fever	2
Injured	30	Apoplexy	2
Smothered	25	Pyæmia	2
Fevered	18	Septic Peritonitis	2
Inflammation	13	Pleurisy	2
Dropsy	10	Parturient Fever	1
Abscesses	7	Anæmia	1
Congestion	7	Pneumonia	1
Hydatids	7	Enteritis	1
Flukes	5	Asphyxia	1
Swine Fever	5	Septicæmia	1
Joint disease	4	Measled	1
Actinomycosis	4	Chokes	1
Black quarter	4	Unseasonable	1
Pericarditis	3		

The following table will show where the meat and fish was condemned, and the amounts taken from each place :—

In the Abattoir and Carcase Market	178,289	lbs.
of which 102,732 lbs. was dressed meat consigned from places outside the City.		
,, Pig Market	7,304	,,
,, Private Slaughter-houses	3,905	,,
At the Pomona Docks	7,757	,,
,, Triperies	3,236	,,
,, Cold Air Stores	2,160	,,
In the Rusholme Abattoirs	262	,,
,, Private Pig Cotes	202	,,
,, Shops	1,109	,,
On the Hawker's Cart	190	,,
At the Farms	12	,,
,, Railway Stations	12,305	,,
,, Fish Markets	156,938	,,

The game, rabbits, poultry, fruit, vegetables, and miscellaneous at Fish Markets :—

Rooks	424	head
Partridge	359	,,
Ptarmigan	135	,,
Quails	132	,,
Pigeons	112	,,
Wood Pigeons	89	,,
Pheasants	72	,,
Grouse	60	,,
Capercailzies Hens	106	,,

Black Game	92	head
Curlews	22	,,
Hares	172	,,
Chickens	466	,,
Ducks	109	,,
Geese	25	,,
Turkeys	49	,,
Rabbits	4,701	,,

At Smithfield Market.

Cherries	446	baskets
	100½	sieves
Strawberries	129	baskets
	21	tubs
Raspberries	62	cases
Plums	50½	sieves
Black Currants	17	sieves
Blackberries	5	sieves
Cauliflowers	17	hampers
Bananas	5	cases
Tomatoes	15	cases
Onions	192	cases
Sprouts	46	baskets
Turnips	40	hampers
Lettuce	38	pots
Gherkins	30	bags
Cress	9	cases
Mushrooms	4½	baskets
Rabbits	549	head

At Railway Station.

Bananas	265	cases
Gooseberries	29	baskets
Onions	248	bags
	32	baskets
Parsnips	40	bags
Cherries	46	sieves
Potatoes	33	bags
Watercress	8	baskets
Mushrooms	8	baskets
Cocoa Nuts	80	bags
Eggs	2½	cases

At Cold Air Stores.

Chickens	842	head
Ducks	443	,,
Turkeys	22	,,
Rabbits	54	,,

With the exception of 3,441 lbs. of meat and 3,808 lbs. of fish the whole of the above amounts have been surrendered* by the trade after being condemned by the Inspector.

THE DISTRIBUTION OF INSPECTION.

Abattoir and Carcase Market.

These establishments are under constant inspection the whole day through, and I may add that the majority of the meat salesmen cordially assist the Inspectors by acquainting them of the expected arrivals of country consignments.

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* The term surrender includes cases in which the Inspector has discovered the diseased meat in the course of his duty.

Fish Markets and Smithfield Fruit Market.

These markets are visited several times a day, and in the summer months an Inspector is in constant attendance.

On Saturday nights, also, one Inspector is on duty until the market closes.

Private Slaughter-houses.

During the year there have been 3,970 visits made to the private slaughter-houses, and 18,969 carcases examined in them. The effect of these visits has been that 31 carcases, and portions of 20 others, were condemned as unfit for human food.

From one slaughter-house 4 pigs were seized and taken to the Police Court to be condemned.

Although the slaughter-houses are visited each week (some of them several times), these visits are arranged to be delivered somewhat irregularly, so that the butchers are unable to fix any specified time for our arrival. I have also received 67 requests from butchers to proceed to inspect their places.

Shops.

There have been 3,600 visits made to the meat, fish, and fruit shops in the poorer districts of the City; of these, 240 were made on Sunday mornings.

One hundred and twenty-six seizures of unwholesome food were made; of these, seven were made on Sundays, and the shop-keepers severely cautioned.

Two orders for the destruction of unsound meat, taken from beef shops, were obtained at the City Police Court.

Legal proceedings have been instigated against one butcher for having in his possession, and exposing for sale, diseased meat, and a fine of £20 and costs was imposed.

The Sunday morning inspections have had a very good effect in greatly improving the condition of the beef, fish, and fruit shops, with regard to the soundness of the food they expose for sale on those days.

Triperies.

These places also receive frequent attention, which has led to the occupiers notifying the Inspectors when they receive consignments of bellies of a doubtful nature, and 11 bellies have been certified tuberculous.

Railway Stations.

Six hundred and twenty-eight visits have been made to the railway stations; these visits are made for two reasons:—

(1) To comply with requirements of the Animals Transit and General Order, 1895, to which reference will be made in the Diseases of Animals Report.

(2) To ascertain what consignments of meat, beast offals, barrels of salted meat, etc., are arriving in the City, many of which are consigned direct to butchers' shops and warehouses, and do not come to the Abattoir for inspection.

Sausage and Pie Factories.

A number of visits were paid to these places, but nothing of an objectionable nature was detected.

Pig Market.

This market is inspected each day, including Sunday, and when sickly or injured pigs are discovered they are ordered to be slaughtered.

Porters Carts and Beef Sheets.

These items receive the attention of the Inspectors, and I regret to say many of these meat carriers are extremely negligent in not keeping their carts and sheets in a thoroughly clean condition.

Disposal of Unsound Meat, Fish, and Slaughter-house Garbage.

This work is carried out by the Cleansing Department. At the Holt Town Depot there is a tank provided for the boiling down of meat, and the fish is dried down in the cylinders. A great part of the diseased meat is burnt in furnaces at the Water Street Depot. The slaughter-house garbage is also disposed of with nightsoil refuse.

Remarks

The number of seizures and surrenders made during the year has been previously stated to be 1,868, and the causes also enumerated. I may, however, be permitted to make a few remarks upon one or two of these conditions.

Decomposition.

I may briefly dismiss this condition by saying that the seizures under its heading are chiefly comprised of fish, shellfish, game, poultry, rabbits, beef offals, both English and foreign, and fruit and vegetables. Of the two latter they reached 49,462lbs. and 82,618lbs. respectively.

Tuberculosis.

This very troublesome disease may be mentioned as being the most serious with regard to its effects upon the meat industry of this City, and one where great conflict of opinion still exist as to its dangerous effects upon meat. It will be remembered that in July last at the British Congress on Tuberculosis, Dr. Koch took the world by surprise in announcing that bovine tuberculosis could not be transmitted to man. This pronouncement has led to the appointment of a new Royal Commission on this disease.

The Local Government Board are, however, anxious that local authorities should not relax any of their vigilance in preventing the sale to the public of tuberculous meat and milk, and have issued orders to this effect.

The Board also require meat inspectors to observe the recommendations set forth in the Royal Commission on Tuberculosis of 1898 with regard to the seizure of tuberculous meat, which I can say are carefully exercised in Manchester.

These recommendations are that the following principles shall be observed in the inspection of tuberculous carcases of cattle :—

(*a*) When there is miliary tuberculosis of both lungs ; (*b*) When tuberculous lesions are present on the pleura and peritoneum ; (*c*) When tuberculous lesions are present in the muscular system or in the lymphatic glands embedded in or between the muscles ; (*d*) When tuberculous lesions exist in any part of an emaciated carcase ;	The entire carcase and all the organs may be seized.
(*a*) When the lesions are confined to the lungs and the thoracic lymphatic glands ; (*b*) When the lesions are confined to the liver ; (*c*) When the lesions are confined to the pharyngeal lymphatic glands ; (*d*) When the lesions are confined to any combination of the foregoing, but are collectively small in extent ;	The carcase, if otherwise healthy, shall not be condemned, but every part of it containing tuberculous lesions shall be seized.

The cattle slaughtered at the Abattoir are principally young heifers and bullocks of the Irish, Welsh, and Norfolk variety. An exceedingly small proportion of cows are killed, and the majority of these also are imported from Ireland and Wales.

It therefore cannot be supposed that amongst such naturally reared animals tuberculosis would be very prevalent—that is to say, not to such an extent as to lead to the destruction of all or part of their carcases.

This misfortune, however, has occurred in 300 cases; of this number, 94 of the carcases were totally condemned, while of the remaining 206 partial seizure only ensued, the aggregate quantity seized being 66,485 lbs.

It will therefore be gathered that confiscation to some degree has taken place in ·84, or rather more than ¾ per cent. of the total animals slaughtered in the Abattoirs.

Of the dressed meat consigned from the country districts, 56 carcases have been found to be tuberculous; of these, 15 were totally condemned, and from the remaining 41 carcases 71 quarters were taken, amounting in all to 13,251 lbs. These carcases are chiefly imported from Cheshire, Lancashire, and Yorkshire, especially from the first named.

Of the total number of dressed carcases received from Cheshire, 6 per cent. turned out tuberculous—indeed 8,864 lbs. of meat from that county was condemned during the year on this account. From the country consignments there were also condemned on account of Tuberculosis, ten pig carcases and portions of five others, amounting to 1,263 lbs.

In the private slaughter-houses, eight animals were observed to be tuberculous; five carcases were totally condemned, and of the remaining three, partial seizure ensued in all, the quantity seized being 2,663 lbs.

Swine Fever.

Nine carcases have been condemned for this affection, of which eight resulted from outbreaks of this disease within the City, and were slaughtered under the Swine Fever Order. One carcase was imported into the market from the country.

Parasites.

The parasites met with were the flukeworm hydatidcysts, the filaria worms, and psorosperms, which, although many of them do not appear transmissible to man, render the organs of animals unmarketable. One carcase of pork was discovered to be affected with a cystic worm known as the cysticercus cellulosæ (commonly called measles), which gives rise to a very common tapeworm in man (tænia solium).

Inflammatory Diseases.

The carcases condemned under these ailments are imported either alive or dressed to the Abattoir, chiefly from dairy farmers around Manchester, and from the dairying districts in the counties of Cheshire, Lancashire, and Yorkshire, and, by reason of emergency, the live animals are brought to the Abattoir at very irregular hours. It is much better, however, that farmers should send their animals here for slaughter when taken suddenly ill than that they should dispose of them in a concealed manner so as to escape inspection. Extreme care is taken over the examination of all animals and carcases showing any signs whatever of having been affected with any form of inflammation, as I regard all inflammatory affections as having a most serious effect upon meat for human consumption.

The Granting of Certificates.

Official certificates are granted, upon request, to all salesmen by the Inspectors for all unwholesome food they condemn.

These certificates are chiefly sought for by the commission agents for the purpose of being forwarded to their senders, as a guarantee to what has been condemned.

One thousand one hundred and sixty-three such certificates have been issued during the past 12 months.

Yours most obediently,

ALFRED HOLBURN,

Chief Inspector.

CONTAGIOUS DISEASES OF ANIMALS.

During the year there have been two outbreaks of glanders within the City. Two horses were found affected with the disease, which were immediately slaughtered by order of the local authority, and post-mortem examinations confirmed the diagnosis. Compensation was paid to their owners to the extent of one-fourth their valuation, their total value being £59.

Three outbreaks of swine fever have occurred, and have been dealt with by the Board of Agriculture.

Inspection.

The Pig Market, Water Street, is visited daily by a Veterinary Inspector under the Swine Fever Order, 1894, and all cases of infringements are reported immediately to the Board of Agriculture.

Railway Stations.

Seven hundred and fifty-six visits have been made to the railway stations and cattle docks for the purposes of the Animal Transit and General Order of 1895.

Horse Market.

The horse market, which is held once a month in the Haymarket, Tonman Street, Deansgate, is inspected by a Veterinary Inspector as required by the Glander and Farcy Order, 1894.

There has been no cases of glanders detected in this market during the year.

Certificates.

One certificate has been granted for the exportation of a horse from Manchester to Malta, as required by the Board of Agriculture of this country and the Chief Officer of Customs at Malta.

New Order of 1901.

The Board of Agriculture have issued a new Order, commencing October 14th, 1901, with regard to the cleansing and disinfection of all premises, vehicles, crates, nets, floats, lairs, etc., used by pig dealers for the keeping and conveying of swine.

The Inspectors are instructed to enforce this Order.

Alfred Holburn, M.R.C.V.S.,
Chief Veterinary Inspector.

TABLES.

TABLE A.—MANCHESTER, 1901.

CAUSES OF DEATH AT DIFFERENT LIFE PERIODS IN THE 52 WEEKS OF THE YEAR.

PERSONS.—(MALES AND FEMALES.)

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
All Causes	11801	3114	1676	337	161	206	289	688	1044	1264	1363	1093	512	54
A.—General Diseases	4,901	1560	928	205	72	110	170	365	497	461	334	158	39	2
B.—Local Diseases	5,448	913	608	104	69	83	110	278	489	723	939	775	326	31
C.—Other Specified Dis:	...	...	...	...	...	...	...	...	...	...	...	...	...	...
D.—Ill-defined Diseases	1,026	570	63	3	2	...	2	7	16	39	41	135	130	18
E.—Violent Deaths	426	71	77	25	18	13	7	38	42	41	49	25	17	3
A.—General Diseases.														
Smallpox.. Vaccinated	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Smallpox.. Not Vaccinated	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Smallpox.. No Statement	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cowpox	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chickenpox	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Measles	292	70	206	15	...	...	...	...	1	...	...	...	...	...
Epidemic Rose Rash	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scarlet Fever..	127	4	81	34	6	1	...	1	...	...	...	...	...	...
Typhus	10	...	...	2	1	...	1	...	3	2	1	...	...	...
Plague	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Relapsing Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Influenza	99	2	3	1	2	4	1	9	17	20	24	12	4	...
Whooping Cough	224	83	125	16	...	...	...	...	...	...	...	...	...	...
Mumps	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Diphtheria and Memb: Croup	133	9	70	49	...	1	2	1	1	...	...	...	...	...
Cerebro-spinal Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Simple Cont: Fever	1	...	...	...	...	...	1	...	...	...	...	...	...	...
Enteric Fever	75	1	...	1	5	15	19	20	11	...	3	...	...	...
Asiatic Cholera	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Epidemic Diarrhœa	381	277	88	1	...	...	1	1	...	6	...	7	...	...
Diarrhœa	629	465	118	2	...	...	...	1	4	5	12	12	8	2
Dysentery	6	4	1	...	...	...	...	...	...	1	...	...	...	...
Malarial Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hydrophobia	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Glanders	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Anthrax	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tetanus	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Syphilis	39	32	2	...	...	...	...	...	2	2	1	...	...	...
Gonorrhœa, Strict: Urethra	8	...	...	...	...	...	1	...	2	1	2	1	1	...
Puerperal.. Septicæmia	19	...	...	...	...	...	6	7	6	...	...	...	...	...
Puerperal.. Pyæmia	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal.. Phlegmasia Dol:	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Puerperal.. *Fever*	14	...	...	...	...	...	6	6	2	...	...	...	...	...
Infective Endocarditis	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Epidemic Pneumonia / Pneumonic Fever	11	...	1	1	...	1	2	1	2	3	...	...	...	...
Erysipelas	37	7	1	...	...	...	1	3	7	5	8	5	...	...
Septicæmia (not puerp:)	14	3	3	1	1	...	1	1	...	1	1	1	1	...
Pyæmia (not puerp:)	8	2	1	1	...	1	...	1	...	1	...	1	...	...
Phlegmon	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phagedœna	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Septic Diseases	1	...	...	...	...	...	..	...	...	1	...	...	...	...
Tubercular Phthisis	368	2	7	9	12	25	41	91	93	63	21	4	...	...
Phthisis	776	2	7	12	12	32	64	171	213	173	70	15	5	...
														...

TABLE A, 1901—*continued.*

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
A.—General Diseases— *continued*														
Tubercular Meningitis	135	29	74	23	6	2	...	...	1	...	...	...	...	...
Tubercular Peritonitis	19	7	3	4	2	1	...	1	1	...	...	...	...	...
Tabes Mesenterica	90	53	30	3	2	1	...	1	...	...	...	...	...	...
Lupus	1	...	...	...	...	...	1	...	...	...	...	...	...	...
Tubercle of other organs	50	21	9	2	3	1	7	3	2	1	1	...	...	...
General Tuberculosis	132	26	41	14	5	11	2	7	9	9	8	...	...	...
Scrofula	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Parasitic Diseases	2	1	...	...	...	...	...	...	...	1	...	...	...	...
Starvation	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scurvy	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Alcoholism, Delirium Tremens	76	...	...	...	...	...	...	13	28	21	11	3	...	...
Opium, Morphia Habit	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ptomaine Poisoning	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Industrial Poisoning: Lead	4	...	...	...	...	...	1	1	...	1	1	...	...	...
Industrial Poisoning: Phosphorus	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Industrial Poisoning: Arsenic, &c.	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rheum: Fever, Acute Rheum:	50	1	...	9	7	5	5	8	7	6	1	...	1	...
Rheumatism of Heart	6	...	...	1	1	2	...	...	...	...	2	...	...	...
Chronic Rheumatism	22	...	...	...	1	...	...	3	1	5	1	9	2	...
Rheum: Arthritis, Rheum: Gout	13	...	...	...	...	...	...	...	3	2	5	2	1	...
Gout	2	...	...	...	...	...	...	...	...	...	...	1	1	..
Carcinoma	235	...	...	...	...	...	...	7	44	60	83	34	7	..
Sarcoma	31	3	2	2	2	...	2	...	7	2	7	3	1	...
"*Cancer*," Malignant Disease	159	...	1	...	...	1	...	2	16	43	50	40	6	...
Rickets	35	16	19	...	...	...	...	...	...	...	...	...	...	...
Purpura	5	...	1	...	...	2	...	...	1	1	...	...	...	...
Hæmophilia, Hæm: Diathesis	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Anæmia, Leucocythæmia	35	2	4	...	1	1	3	2	5	8	8	...	1	..
Diabetes Mellitus	56	...	1	1	2	2	2	3	7	17	13	8	...	...
Premature Birth	334	334	...	...	...	...	...	...	...	...	...	...	...	...
Congenital Defects	69	64	2	1	1	1	...	...	...	...	...	...	...	...
Injury at Birth	3	3	...	...	...	...	...	...	...	...	...	...	...	...
Atelectasis	10	10	...	...	...	...	...	...	...	...	...	...	...	...
Want of Breast Milk	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Teething	50	24	26	...	...	...	...	...	...	...	...	...	...	...
B.—Local Diseases.														
1.–NERVOUS SYSTEM.														
Inflammation of Brain	151	50	55	19	6	3	1	2	6	5	3	1	...	...
Softening of Brain	19	...	...	...	...	...	1	...	...	5	6	7	...	...
General Paraly: of Insane	42	...	...	...	...	...	...	8	10	9	9	4	2	...
Insanity (not puerperal)	101	...	...	...	...	2	...	8	11	15	19	26	20	...
Chorea	2	...	...	...	1	...	1	...	...	...	...	...	...	..
Epilepsy	39	2	2	3	2	...	3	4	3	10	4	4	2	...
Convulsions	194	165	27	...	...	...	1	...	...	1	...	...	...	...
Laryngismus Stridulus	13	5	5	1	...	...	...	...	...	1	...	1	...	...
Locomotor Ataxy	8	...	...	...	...	...	...	...	3	2	...	3	...	...
Dis: of Spinal Cord	32	...	2	...	2	...	...	4	6	6	8	4	...	...
Neuritis	18	...	...	...	...	...	...	3	6	3	5	1	...	...
Brain Tumour	9	...	...	...	1	...	1	1	2	2	1	1	...	...
Nervous System (other Dis :)	40	6	1	2	1	2	...	1	7	3	7	8	1	1
2. DISEASES OF SPECIAL SENSE ORGANS.														
Otitis, Mastoid Disease	14	2	1	2	2	2	2	1	1	...	...	1	...	...
Epistaxis, Nose Disease	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Ophthalmia, Eye Disease	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE A, 1901—*continued.*

CAUSES OF DEATH	All Ages	AGES AT DEATH UNDER 5 YEARS 0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
3. DISEASES OF HEART.														
Valvular Dis : Endocarditis	233	...	...	2	18	13	12	17	37	54	54	16	9	1
Pericarditis	15	1	...	1	1	3	2	3	1	...	2	1	...	...
Hypertrophy of Heart	1	...	...	...	...	...	...	...	...	...	...	...	1	...
Angina Pectoris	10	...	...	...	...	...	...	...	2	2	3	2	1	...
Dilatation of Heart	95	2	...	...	...	...	...	4	13	19	29	23	5	...
Fatty Degen : of Heart	17	...	...	...	...	...	...	...	1	6	7	3	...	...
Syncope, Heart Disease	586	15	4	6	7	16	10	26	49	98	130	145	69	11
4. DIS : OF BLOOD VESSELS.														
Cerebral Hæmorrhage	218	...	...	..	...	2	4	5	19	38	71	53	24	2
Apoplexy, *Hemiplegia*	175	1	1	...	...	1	...	7	10	30	61	42	21	1
Aneurism	9	...	...	...	...	...	1	1	1	2	4	...	...	...
Senile Gangrene	16	...	...	...	...	...	...	...	...	1	3	8	4	...
Embolism, Thrombosis	8	...	...	...	...	2	...	...	2	1	3	...	...	...
Phlebitis	3	...	...	...	...	...	...	...	1	2	...	...	...	...
Varicose Veins	1	...	...	...	...	...	...	...	...	...	...	1	...	...
Blood Vessels (Other Diseases)	9	...	...	...	...	...	...	1	1	1	3	2	1	...
5. DIS : OF RESPIRATORY SYS :														
Laryngitis	21	5	11	...	...	...	...	2	...	1	2	...	...	...
Memb: Laryng: (Not Diphth:)	3	...	2	1	...	...	...	...	...	...	...	...	...	...
Croup	8	1	6	1	...	...	...	...	...	...	...	...	...	...
Larynx (Other Dis :)	1	...	...	...	...	...	...	...	...	...	...	1	...	...
Bronchitis	1,072	242	130	12	...	3	2	17	46	109	205	199	102	5
Pneumonia { Lobar	73	1	5	...	2	2	5	16	19	9	8	5	1	...
Pneumonia { Broncho	463	148	202	11	1	2	7	5	7	19	27	24	9	1
"*Pneumonia*"	676	64	85	18	9	14	21	66	99	90	97	82	26	5
Emphysema, Asthma	29	...	...	...	...	...	...	4	1	10	7	7	...	...
Pleurisy	40	1	3	...	...	1	1	3	11	3	10	7	...	...
Fibroid Disease of Lung	14	...	...	...	...	...	...	...	3	4	4	3	...	...
Respiratory Dis: (Other)	47	13	5	1	...	...	2	1	2	9	3	7	4	...
6. DIS: OF DIGESTIVE SYS:														
Tonsillitis, Quinsy	5	1	4	...	...	...	...	...	...	...	...	...	...	...
Mouth, Pharynx	16	8	7	...	...	...	...	...	...	...	1	...	...	...
Gastric Ulcer	57	26	...	...	...	1	9	7	5	3	5	1	...	...
Gastric Catarrh	7	...	1	...	...	...	...	...	1	...	2	2	1	...
Stomach (Other Dis:)	63	35	5	2	2	1	1	...	2	7	2	5	1	...
Enteritis	38	25	7	1	...	...	...	2	1	1	1	...	...	...
Gastro-Enteritis	48	34	10	1	...	1	...	1	...	1	...	...	...	...
Appendicitis, Perityph :	7	...	1	...	2	2	...	...	...	2	...	...	...	...
Hernia	39	4	1	...	...	...	...	1	2	10	10	10	1	...
Intestinal Obstruct:	37	4	2	...	...	3	1	1	5	3	7	6	4	1
Other Diseases of Intestines	19	6	2	...	2	...	...	2	1	2	1	2	1	...
Peritonitis	50	1	4	9	4	1	3	8	7	8	4	...	...	1
Cirrhosis of Liver	95	...	1	...	...	...	...	4	18	36	27	9	...	...
Liver and Gall Bladder (O. D.).	49	15	...	...	2	...	...	3	7	8	10	2	1	1
Digestive System (Other Dis:)	19	7	2	...	...	...	1	...	...	5	1	2	1	...
7. DIS : OF LYMPHATIC AND DUCTLESS GLANDS.														
Spleen, Disease of	3	...	2	...	...	1	...	...	...	...	...	...	...	...
Lymphat: Syst: (Other Dis:)	7	2	...	...	1	...	...	...	1	1	2	...	...	...
Thyroid Body (Other Dis:)	3	...	...	...	...	...	1	1	1	...	...	...	...	...
Supra Renal Caps: (Dis: of)	1	...	...	...	...	...	...	...	1	...	...	...	...	...
8. DISEASES OF URINARY SYSTEM.														
Nephritis Ac:, Uræmia	73	4	6	5	1	2	3	9	14	9	12	7	1	...
Ch : Bright's Dis : Albumin :	155	...	...	2	2	1	6	11	24	47	38	21	3	...
Calculus	3	...	...	...	...	...	...	...	...	...	3	...	...	...
Bladder and Prostate Dis :	24	...	...	...	...	...	...	1	1	...	6	10	5	1
Urinary Syst : (Other Dis :)	15	3	...	...	...	...	...	...	1	1	5	1	4	...

TABLE A, 1901—*concluded.*

CAUSES OF DEATH	Ages at Death													
	All Ages	Under 5 Years		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
9. Diseases of Generative System.														
Ovarian Tumour	5	...	...	...	...	...	...	...	1	...	4	...	...	...
Other Dis : of Ovary	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Uterine Tumour	4	...	...	...	...	...	...	2	2	...	...	...	...	...
Other Dis: of Uterus and Vagina	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Disord : of Menstruation	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gener: and Mam: Orgs: (other)	6	...	...	...	...	...	1	1	1	2	...	1	...	...
10. Diseases of Pregnancy and Childbirth.														
Abortion, Miscarriage	3	...	...	...	...	...	1	2	...	...	...	...	...	...
Puerperal Mania	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Puerperal Convulsions	5	...	...	...	...	...	2	1	2	...	...	...	...	...
Placenta Præv: Flooding.........	6	...	...	...	...	...	1	3	2	...	...	...	...	...
Other Ac: of Preg: & Childbirth	12	...	...	...	...	...	...	7	5	...	...	...	...	...
11. Diseases of Locomotor System.														
Caries, Necrosis	5	...	1	2	...	...	1	...	1	...	...	...	...	...
Arthritis, Periostitis	3	...	...	...	...	1	...	1	...	1	...	...	...	...
Locomotor Sys : (Other).........	6	...	1	1	...	...	1	...	1	2	...	...	...	...
12. Diseases of the Skin.														
Ulcer, Bedsore	6	...	...	...	...	...	...	...	...	2	2	2	...	...
Eczema	3	1	1	...	...	...	...	...	...	...	...	1	...	...
Pemphigus...........................	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Skin Diseases (other)	20	9	3	...	...	1	1	...	1	2	1	1	1	...
C.—Other Specified Diseases	...	...	...	...	...	...	...	...	...	...	...	...	...	...
D.—Ill-defined and not Specified Diseases.														
Atrophy, Debility.................	616	504	47	...	2	...	...	...	...	1	5	28	26	3
Old Age	207	...	...	...	...	...	...	...	...	...	12	87	94	14
Dropsy, Ascites, Anasarca	3	..	...	...	...	...	...	...	...	2	...	...	1	...
Tumour	4	...	...	...	...	...	...	...	1	2	...	...	...	1
Abscess	2	1	...	1	...	...	...	...	...	...	...	...	...	...
Hæmorrhage	3	1	...	...	...	...	...	1	...	1	...	...	...	...
Sudden (cause unascertained)...	120	38	12	2	...	...	1	5	8	16	20	13	5	...
Other Ill-defined	71	26	4	...	...	...	1	1	7	17	4	7	4	...
E.—Violent Deaths.														
1. Accident.														
In Mines and Quarries...........	2	...	...	...	...	1	...	...	...	1	...	...	...	...
Vehicles and Horses..............	38	...	10	2	3	...	1	7	5	3	3	3	1	...
Ships, Boats, Docks (not Drowning)	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Building Operations	5	...	...	...	...	1	...	1	2	...	1	...	...	...
Machinery	8	...	...	...	...	...	...	5	1	1	1	...	...	...
Weapons and Implements	3	...	1	...	...	...	...	...	...	1	...	1	...	...
Burns and Scalds	76	2	46	9	3	2	1	1	5	2	4	1	...	...
Poison, Poisonous Vapours......	16	1	1	1	...	1	1	1	5	1	3	1	...	...
Drowning	52	...	6	8	4	2	1	7	5	8	7	1	3	...
Suffocation..........................	71	66	5	...	...	...	...	...	...	...	...	...	...	...
Falls	77	...	5	3	4	...	1	6	7	9	16	15	8	3
Weather Agencies..................	1	...	...	...	...	1	...	...	...	...	...	...	...	...
Otherwise or not Stated	30	1	2	2	4	2	1	5	4	5	1	1	2	...
2. Homicide.	2	1	1	...	...	...	...	...	...	...	...	...	...	...
3. Suicide.	45	...	...	..	...	3	1	5	8	10	13	2	3	...
4. Execution.	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE B.—MANCHESTER, 1901.

Causes of Deaths at Different Life Periods—MALES.

Classes	CAUSES OF DEATH	All Ages Total	Ages at Death—in years												
			Under 5 Years												
			0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
	All Causes	6128	1745	839	163	75	117	144	367	576	680	710	489	205	18
A	Smallpox	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Measles	162	40	112	10	...	..	...	...	...	...	...	...	...	...
	Scarlet Fever	60	3	38	16	2	1	...	...	...	...	...	...	...	...
	Typhus Fever	4	...	...	1	1	...	1	...	1	...	...	...	...	...
	Whooping Cough	93	41	49	3	...	...	...	...	...	...	...	...	...	...
	Diphtheria, Memb: Croup	59	2	38	17	...	...	1	1	...	...	...	...	...	...
	Ill-defined Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Enteric Fever	53	1	...	1	4	12	13	14	7	...	1	...	...	...
	Influenza	53	1	...	1	1	2	1	7	7	11	14	6	2	...
	Simple Cholera	9	7	2	...	...	...	...	...	...	...	...	...	...	...
	Diarrhœa, Dysentery	558	420	111	2	...	...	...	...	4	7	5	7	2	...
	Venereal Affections	31	20	1	...	...	...	1	...	3	1	3	1	1	...
	Erysipelas	15	4	...	...	...	...	...	1	5	...	2	3	...	...
	Pyæmia, Septicæmia	14	3	2	2	...	...	1	2	...	2	...	1	1	..
	Puerperal Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Other Zymotics	5	...	2	1	...	...	...	...	...	2	...	...	...	...
	Tuberc. Periton: Tabes Mes:	58	32	16	6	1	1	...	2	...	...	...	...	...	...
	Tubercular Meningitis	72	17	38	12	3	2	...	...	...	...	...	...	...	...
	Phthisis	673	1	4	5	7	28	48	136	198	164	67	11	4	...
	Tuberculous Dis. (other)	97	25	24	8	2	7	6	5	6	6	8	...	...	...
	Parasitic Diseases	1	1	...	...	..	...	...	...	...	...	...	...	...	...
	Alcoholism	41	...	...	...	...	...	...	9	13	11	5	3	...	...
	Rheumatic Fever	22	...	...	4	1	2	3	4	4	3	1	...	...	...
	Cancer	180	2	2	2	2	1	...	4	26	44	56	38	3	...
	Premature Birth	169	169	...	...	...	...	...	...	...	...	...	...	...	...
	Congenital Defects	63	59	2	1	1	...	...	...	...	...	...	...	...	...
B and C	Epilepsy	20	...	1	2	...	...	1	2	2	6	4	2	...	...
	Convulsions	105	91	14	...	...	...	...	...	...	...	...	...	...	...
	Nervous Syst: (other)	238	37	35	12	8	5	1	12	29	23	27	35	13	1
	Cereb: Haem: Apoplexy, Hemip:	166	1	1	...	...	2	3	6	10	33	54	39	16	1
	Heart and Blood Vessel Dis:	444	12	1	3	6	21	12	25	47	86	117	74	36	4
	Croup	3	...	3	...	...	...	...	...	...	...	...	...	...	...
	Bronchitis	503	133	59	7	...	1	2	9	20	46	97	88	39	2
	Pneumonia	703	130	139	16	8	13	25	52	79	79	83	58	18	3
	Respiratory Dis: (other)	81	5	13	1	...	...	1	8	12	15	15	10	1	...
	Digestive Syst: (other)	270	91	29	7	7	4	3	12	23	38	38	14	3	1
	Urinary Syst: (other)	145	2	3	4	1	...	3	9	21	37	37	19	8	1
	Generative Organs	2	...	...	...	...	...	..	...	...	1	...	1	...	...
	Other specified Diseases	145	21	31	1	6	7	9	8	17	14	19	7	5	...
D	Marasmus and Atrophy	339	293	18	...	...	...	..	...	...	...	2	13	12	1
	Old Age	70	...	...	...	...	...	...	...	...	...	6	32	28	4
	Other Ill-defined Causes	130	42	11	1	...	...	2	5	11	22	16	15	5	...
E	Violence	272	39	40	17	14	8	7	34	31	29	33	12	8	...

TABLE C.—MANCHESTER, 1901.

Causes of Deaths at Different Life Periods—FEMALES.

Classes	CAUSES OF DEATH	All Ages	Ages at Death—in years: Under 5 Years												
		Total	0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
	All Causes	5673	1369	837	174	86	89	145	321	468	584	653	604	307	36
	Smallpox	...	...	...	...	...	...	...	...	...	...	...	...	...	...
A	Measles	130	30	94	5	...	...	...	...	1	...	...	...	...	...
	Scarlet Fever	67	1	43	18	4	...	...	1	...	...	...	...	...	...
	Typhus Fever	6	...	...	1	...	...	...	...	2	2	1	...	...	...
	Whooping Cough	131	42	76	13	...	...	...	...	...	...	...	...	...	...
	Diphtheria, Memb: Croup	74	7	32	32	...	1	1	...	1	...	...	...	...	...
	Ill-defined Fever	1	...	...	...	...	...	1	..	...	...	...	...	...	...
	Enteric Fever	22	...	...	...	1	3	6	6	4	...	2	...	...	...
	Influenza	46	1	3	...	1	2	...	2	10	9	10	6	2	...
	Simple Cholera	12	8	4	...	...	...	...	...	...	...	...	...	...	...
	Diarrhœa, Dysentery	437	311	90	1	...	...	1	2	...	5	7	12	6	2
	Venereal Affections	16	12	1	...	...	...	...	...	1	2	...	...	...	...
	Erysipelas	22	3	1	...	...	...	1	2	2	5	6	2	...	...
	Pyæmia, Septicæmia	9	2	2	...	1	1	...	...	...	1	1	1	...	...
	Puerperal Fever	34	...	...	...	...	...	12	13	9	...	...	...	...	...
	Other Zymotics	8	1	...	...	...	1	2	1	2	1	...	...	...	...
	Tubercular Periton: Tabes Mes.	51	28	17	1	3	1	...	...	1	...	...	...	...	...
	Tubercular Meningitis	63	12	36	11	3	...	...	...	1	...	...	...	...	...
	Phthisis	471	3	10	16	17	29	57	126	108	72	24	8	1	...
	Tuberculous Diseases (other)	86	22	26	8	6	5	4	5	5	4	1	...	...	...
	Parasitic Diseases	1	...	...	...	...	...	...	...	...	1	...	...	...	...
	Alcoholism	35	...	...	...	...	...	...	4	15	10	6	...	...	...
	Rheumatic Fever	28	1	...	5	6	3	2	4	3	3	...	...	1	...
	Cancer	245	1	1	...	...	...	2	5	41	61	84	39	11	...
	Premature Birth	165	165	...	...	...	...	...	...	...	...	...	...	...	...
	Congenital defects	45	44	...	...	...	1	...	...	...	...	...	...	...	...
B and C	Epilepsy	19	2	1	1	2	...	2	2	1	4	...	2	2	...
	Convulsions	89	74	13	...	...	...	1	...	...	1	...	...	...	...
	Nervous System (other)	197	24	28	10	3	2	3	15	22	28	31	21	10	...
	Cerebral Hemorrhage, Apoplexy, and Hemiplegia	227	...	...	...	...	1	1	6	19	35	78	56	29	2
	Heart and Blood Vessel Diseases	559	6	3	6	20	13	13	27	61	100	121	127	54	8
	Croup	5	1	3	1	...	...	...	...	...	...	...	...	...	...
	Bronchitis	569	109	71	5	...	2	...	8	26	63	108	111	63	3
	Pneumonia	509	83	153	13	4	5	8	35	46	39	49	53	18	3
	Respiratory Diseases (other)	74	14	8	1	...	1	2	2	5	12	11	15	3	...
	Digestive System (other)	279	75	18	6	5	5	12	17	26	48	33	25	7	2
	Urinary System (other)	125	5	3	3	2	3	6	12	19	20	27	20	5	...
	Generative Organs and Childbirth	41	...	...	1	...	...	5	16	14	1	4	...	...	...
	Other specified Diseases	134	15	29	6	2	5	3	4	7	28	16	18	1	...
D	Marasmus and Atrophy	277	211	29	...	2	...	...	...	...	1	3	15	14	2
	Old Age	137	...	...	...	...	...	...	...	...	...	6	55	66	10
	Other Ill-defined Causes	73	24	5	2	...	...	...	2	5	16	8	5	5	1
E	Violence	154	32	37	8	4	5	...	4	11	12	16	13	9	3

TABLE D.

CITY OF MANCHESTER, 1901.—CAUSES OF DEATH IN INFANCY AND CHILDHOOD.

CAUSES OF DEATH	UNDER ONE YEAR			Total under One Year	ONE AND UNDER FIVE YEARS				Total under Five Years
	Under 3 months	3–6 months	6–12 months		1–	2–	3–	4–	
All Causes	1,395	674	1,045	3,114	947	342	235	152	4,790
Measles	2	6	62	70	97	63	32	14	276
Scarlatina	...	...	4	4	14	17	31	19	85
Whooping Cough	4	23	56	83	74	20	20	11	208
Diphtheria (Memb: Croup)	1	...	8	9	15	16	24	15	79
Fever (various forms)	...	...	1	1	...	...	...	...	1
Diarrhœal Diseases	161	245	340	746	175	22	8	2	953
Syphilis	22	4	6	32	2	...	...	...	34
Tabes Mesenterica	10	23	20	53	21	4	4	1	83
Hydrocephalus	3	9	17	29	30	20	17	7	103
Scrofula (other)	15	16	27	58	35	16	9	7	125
Premature Birth	327	3	4	334	...	...	...	...	334
Teething	...	3	21	24	24	2	...	...	50
Convulsions	110	23	32	165	15	8	3	1	192
Brain Diseases (other)	8	15	40	63	34	12	10	9	128
Lung Diseases	128	104	243	475	277	95	42	35	924
Atrophy, Marasmus	337	105	62	504	41	5	...	1	551
Found Dead in Bed	57	19	5	81	5	...	...	...	*86
Suffocation	2	...	...	2	1	...	1	...	4
Violence (other forms)	...	...	4	4	19	15	24	14	76
Ill-defined Causes	34	3	13	50	11	1	2	...	64
Unclassified	174	73	80	327	57	26	8	16	434

* 68 of these were "Found dead in bed, suffocated."

(*a*) from all causes, and (*b*) from specified causes; also the percentages to total deaths of Inquest Cases, and of Deaths in Public Institutions.

Years	Estimated Populations (Mean)	Persons Married	Annual Rates per 1,000 Persons living													Percentages to Total Deaths		Years
			Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhœa and Dysentery	English Cholera	Violence	Inquest Cases	Deaths in Public Institutions	
Quinquennial Averages 1871–1875	477,344	24·6	38·9	28·3	0·26	0·64	1·08	0·08	0·78	0·14	0·43	0·21	1·92	0·03	0·94	7·2	13·4	Quinquennial Averages 1871–1875
1876–1880	509,802	18·6	38·7	26·2	0·24	0·53	1·07	0·13	0·84	0·08	0·29	0·11	1·22	0·04	0·89	7·5	14·3	1876–1880
1881–1885	542,746	17·9	35·1	23·6	0·04	0·71	0·48	0·10	0·68	0·05	0·20	0·03	0·96	0·03	0·72	7·0	15·9	1881–1885
1886–1890	575,630	16·6	33·4	24·6	0·02	0·83	0·50	0·32	0·54	0·02	0·30	0·01	1·06	0·02	0·78	6·9	17·7	1886–1890
1891–1895	517,801	16·9	33·2	23·6	0·03	0·62	0·26	0·27	0·64	0·00	0·24	0·01	1·14	0·05	0·77	7·1	19·2	1891–1895
1896–1900	539,599	18·2	32·5	22·7	...	0·89	0·20	0·13	0·53	0·00	0·18	0·01	1·65	0·04	0·73	7·1	20·2	1896–1900
Avge. 30 yrs. 1871–1900	527,154	18·8	35·3	24·8	0·10	0·70	0·60	0·17	0·67	0·05	0·27	0·06	1·32	0·03	0·80	7·1	16·8	1871–1900 Avge. 30 yrs.
1871	464,866	24·2	38·1	29·3	0·72	0·84	0·71	0·04	0·61	0·20	0·45	0·35	2·58	0·02	0·90	6·3	13·7	1871
1872	471,023	25·8	39·3	27·3	0·32	0·33	1·02	0·09	1·22	0·17	0·40	0·17	2·07	0·04	0·90	6·9	13·5	1872
1873*	477,261	24·8	38·3	28·0	0·08	0·85	1·43	0·05	0·38	0·15	0·46	0·20	1·92	0·05	0·83	7·3	12·8	1873*
1874	483,582	23·8	39·3	28·7	0·05	0·62	1·33	0·07	0·83	0·08	0·39	0·19	1·71	0·01	0·94	7·3	13·5	1874
1875	489,987	24·2	39·5	28·4	0·11	0·54	0·92	0·14	0·88	0·11	0·44	0·12	1·32	0·01	1·12	8·4	13·3	1875
1876	496,476	20·2	40·0	28·0	0·80	0·65	1·13	0·10	0·81	0·16	0·42	0·17	1·50	0·02	1·05	7·4	14·4	1876
1877	503,051	19·8	39·5	26·1	0·36	0·59	1·05	0·13	0·84	0·11	0·29	0·12	0·82	0·01	0·86	7·9	14·9	1877
1878	509,714	18·8	39·7	26·8	0·01	0·45	1·07	0·14	0·68	0·06	0·31	0·10	1·42	0·07	0·91	7·6	14·4	1878
1879*	516,464	16·8	37·3	25·2	0·00	0·35	1·07	0·13	1·09	0·02	0·18	0·07	0·62	0·01	0·81	7·3	14·2	1879*
1880	523,304	17·2	36·9	25·0	0·01	0·63	1·03	0·14	0·76	0·04	0·26	0·07	1·73	0·09	0·80	7·1	13·7	1880
1881	530,051	17·8	35·9	22·8	0·03	0·29	0·34	0·09	0·71	0·03	0·17	0·06	0·73	0·02	0·84	8·1	15·9	1881
1882	536,324	18·8	35·7	24·0	0·05	0·89	0·34	0·11	0·87	0·10	0·25	0·04	1·00	0·03	0·67	7·2	14·5	1882

TABLE E—*Continued.*

YEARS	Estimated Populations (Mean)	Persons Married	ANNUAL RATES PER 1,000 PERSONS LIVING												PERCENTAGES TO TOTAL DEATHS		YEARS
			Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhœa and Dysentery	English Cholera	Violence	Inquest Cases	Deaths in Public Institutions	
1883	542,671	17·8	34·9	24·4	0·01	0·71	0·81	0·11	0·62	0·05	0·20	0·03	0·95	0·03	0·73	7·0	15·5	1883
1884*	549,093	18·0	34·4	23·4	0·01	0·57	0·74	0·08	0·49	0·03	0·19	0·03	1·46	0·05	0·65	6·2	17·3	1884*
1885	555,591	17·0	34·8	23·6	0·08	1·08	0·17	0·10	0·71	0·04	0·17	0·01	0·64	0·02	0·69	6·4	16·4	1885
1886	562,166	16·4	34·7	24·1	0·00	0·27	0·41	0·15	0·57	0·03	0·29	0·01	1·34	0·04	0·71	7·2	17·0	1886
1887	568,819	16·6	33·9	25·4	0·01	1·54	0·63	0·23	0·50	0·02	0·31	0·01	1·19	0·02	0·77	6·9	16·1	1887
1888	575,550	16·0	33·3	23·3	0·07	0·27	0·42	0·36	0·79	0·02	0·33	0·02	0·71	0·01	0·74	6·7	18·3	1888
1889	582,362	17·0	33·1	24·2	0·00	1·22	0·45	0·51	0·45	0·01	0·31	0·01	1·00	0·03	0·89	6·5	18·2	1889
1890*	589,253	17·0	31·8	26·2	...	0·83	0·60	0·36	0·37	0·01	0·27	0·02	1·04	0·02	0·79	7·0	19·1	1890*
1891†	‡ 508,673	17·2	33·8	26·0	...	0·43	0·22	0·25	1·02	0·01	0·37	0·01	0·81	0·04	0·79	6·8	18·4	1891†
1892†	‡ 513,196	17·2	33·4	23·2	0·00	0·72	0·27	0·25	0·72	0·00	0·24	0·01	0·79	0·02	0·77	7·4	18·2	1892†
1893†	‡ 517,760	16·0	33·4	24·3	0·09	0·57	0·27	0·35	0·46	0·00	0·25	0·01	1·75	0·10	0·76	6·9	18·7	1893†
1894†	‡ 522,365	16·8	31·8	19·8	0·04	0·42	0·22	0·29	0·55	...	0·17	0·01	0·70	0·02	0·75	7·5	21·3	1894†
1895†	‡ 527,010	17·4	33·4	24·5	0·00	0·96	0·33	0·21	0·47	...	0·18	0·01	1·66	0·06	0·80	6·9	19·2	1895†
1896†*	‡ 531,697	18·3	32·8	22·0	...	1·05	0·37	0·15	0·66	0·00	0·22	0·01	1·04	0·02	0·71	7·4	19·7	1896†*
1897†	‡ 536,426	17·8	32·9	22·4	...	1·17	0·23	0·08	0·56	0·00	0·18	0·00	1·74	0·06	0·68	6·6	20·0	1897†
1898†	‡ 541,296	18·3	32·3	21·2	...	0·50	0·12	0·09	0·31	...	0·22	0·01	1·96	0·06	0·69	7·0	19·5	1898†
1899†	‡ 546,010	18·4	32·2	23·9	...	1·28	0·08	0·16	0·42	0·00	0·13	0·01	2·02	0·03	0·78	7·0	19·7	1899†
1900†	‡ 542,566	18·0	32·4	23·8	...	0·47	0·19	0·19	0·68	...	0·14	0·01	1·49	0·03	0·78	7·4	21·9	1900†
1901†	‡ 546,408	17·6	28·7	21·6	...	0·53	0·23	0·24	0·41	0·02	0·14	0·00	1·86		0·78	7·9	23·2	1901†

* The facts for these years are for 53 instead of 52 weeks; corrections have, therefore, been made in calculating the rates.

† The populations and rates for the years subsequent to 1890, except the marriage rates, relate to the City of Manchester as enlarged by the Act of that year. The facts and rates for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

‡ These figures include a proportion of the inmates of certain Extra-municipal Institutions which receive patients from the City of Manchester, and are therefore in excess of the estimates of the Registrar-General.

NOTE.—The population for 1900 is based on the Census figures of 1891 and 1901.

TABLE F, 1881 TO 1901.—MANCHESTER.

ANNUAL RATES OF MORTALITY FROM CERTAIN CAUSES OF DEATH.

	Year	Annual Rates per 1,000 Persons living										Rates per 1,000 Births	
		Cancer	Tabes Mesenterica	Phthisis	Other Tuber: Diseases	Diseases of Nervous System	Diseases of Circulatory System	Diseases of Respiratory System	Diseases of Digestive System	Diseases of Urinary System	Diseases of Generative System	Puerperal Fever	Childbirth
Quinquennial Periods	1881–1885	0·50	0·35	2·42	0·57	3·28	1·37	5·41	1·23	0·48	0·08	3·03	1·99
	1886–1890	0·64	0·36	2·24	0·59	3·09	1·73	5·76	1·23	0·61	0·08	3·22	2·13
	1891–1895	0·62	0·22	2·09	0·75	1·74	2·53	5·56	1·07	0·52	0·07	2·75	3·42
	1896–1900	0·73	0·19	2·04	0·63	1·32	2·54	5·03	1·04	0·49	0·09	1·55	1·51
Average 20 years	1881–1900	0·62	0·28	2·20	0·64	2·36	2·04	5·44	1·14	0·43	0·08	2·64	2·26
	1881	0·48	0·28	2·46	0·52	3·33	1·19	5·57	1·24	0·39	0·07	3·15	1·37
	1882	0·44	0·40	2·41	0·61	3·35	1·34	5·33	1·19	0·45	0·08	3·92	1·62
	1883	0·54	0·34	2·54	0·59	3·32	1·33	5·66	1·20	0·50	0·06	2·27	1·58
	1884*	0·51	0·39	2·34	0·56	3·27	1·44	4·88	1·23	0·59	0·10	2·81	2·55
	1885	0·51	0·36	2·34	0·56	3·12	1·53	5·59	1·28	0·49	0·08	3·05	2·84
	1886	0·56	0·43	2·44	0·59	3·30	1·53	5·43	1·26	0·57	0·08	2·67	1·85
	1887	0·62	0·39	2·19	0·53	3·17	1·66	5·72	1·23	0·53	0·08	3·58	1·35
	1888	0·65	0·31	2·14	0·62	3·19	1·72	5·31	1·16	0·62	0·10	4·12	1·77
	1889	0·70	0·36	2·12	0·59	2·94	1·79	5·06	1·28	0·64	0·08	3·06	1·87
	1890*	0·65	0·33	2·33	0·62	2·87	1·93	7·28	1·22	0·66	0·08	2·68	3·89
	1891†	0·63	0·25	2·20	0·78	2·30	2·69	6·77	1·03	0·55	0·07	3·08	4·01
	1892†	0·61	0·21	2·05	0·75	1·70	2·59	5·44	1·14	0·53	0·05	3·79	4·54
	1893†	0·59	0·26	2·05	0·76	1·70	2·48	5·53	1·20	0·53	0·07	3·70	3·94
	1894†	0·66	0·18	1·97	0·67	1·48	2·31	4·35	0·96	0·49	0·04	1·93	2·77
	1895†	0·63	0·22	2·16	0·77	1·51	2·60	5·73	1·04	0·49	0·11	1·25	1·82
	*1896†	0·66	0·13	2·00	0·60	1·33	2·53	5·19	1·04	0·46	0·11	0·96	1·47
	1897†	0·74	0·22	2·12	0·67	1·35	2·45	4·51	1·03	0·51	0·10	2·10	1·36
	1898†	0·73	0·19	1·95	0·67	1·22	2·15	4·27	1·00	0·54	0·09	1·72	1·54
	1899†	0·75	0·24	2·05	0·61	1·34	2·73	5·47	0·99	0·47	0·10	1·37	1·54
	1900†	0·76	0·17	2·09	0·60	1·37	2·82	5·78	1·15	0·48	0·05	1·59	1·65
	1901†	0·78	0·20	2·09	0·58	1·22	2·55	4·48	1·00	0·49	0·03	2·17	1·72

* The facts for these years are for 53 instead of 52 weeks; corrections have therefore been made in calculating the rates.

† The rates of mortality for the years subsequent to 1890 refer to the City of Manchester as enlarged by the Act of that year. The rates for 1890 and for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

TABLE G, 1901.—Population, Area, Density. Total Births and Deaths, with Birth and Death Rates.

[Institution Populations, Births and Deaths, distributed.]

Statistical Divisions		Estimated Population	Area in Acres	Persons to an Acre	Births		Deaths	
					Total	Rate per 1,000	Total	Rate per 1,000
City of Manchester ……		**546,408**	**12,910**	**42**	**15,691**	**28·72**	**11,801**	**21·60**
I.	Manchester Township..	135,006	1,646	82	3,926	29·08	3,716	27·52
II.	North Manchester ……	167,257	7,321	23	4,963	29·67	2,938	17·57
III.	South Manchester ……	244,145	3,943	62	6,802	27·86	5,147	21·08
I	Ancoats ……………….	45,014	400	113	1,429	31·75	1,275	28·32
	Central ………………	30,047	748	40	711	23·66	878	29·22
	St. George's……………	59,945	498	120	1,786	29·79	1,563	26·07
II.	Cheetham ……………	37,207	919	41	1,174	31·55	528	14·19
	Crumpsall ……………	8,852	733	12	216	24·40	142	16·04
	Blackley ………………	8,878	1,840	5	218	24·56	139	15·66
	Harpurhey ……………	15,893	193	82	493	31·02	273	17·18
	Moston ………………	12,161	1,297	9	368	30·26	185	15·21
	Newton Heath ………	40,525	1,350	30	1,047	25·84	712	17·57
	Bradford ………………	23,766	288	83	814	34·25	524	22·05
	Beswick ………………	11,686	96	122	380	32·52	267	22·85
	Clayton ………………	8,289	605	14	253	30·52	168	20·27
III.	Ardwick ………………	41,454	509	81	1,280	30·88	865	20·87
	Openshaw ……………	27,358	581	47	853	31·18	552	20·18
	West Gorton …………	29,459	318	93	874	29·67	562	19·08
	Rusholme and Kirk. …	20,544	1,412	15	634	30·86	391	19·03
	Chorlton-upon-Medlock	57,956	646	90	1,218	21·02	1,138	19·64
	Hulme…………………	67,374	477	141	1,943	28·84	1,639	24·33

Note.—Calculated on the Census of 1891 and 1901.

TABLE H, 1901.

Births Registered in the City of Manchester, in its Main Divisions and in Districts; Distinguishing Legitimate and Illegitimate Births; also the Proportion of Mortality among Infants of both Classes under One Year of Age.

STATISTICAL DIVISIONS		BIRTHS		Percentage of Illegitimate Births to Total Births	DEATHS UNDER 1 YEAR		PROPORTION OF DEATHS UNDER 1 YEAR PER 1,000 BIRTHS		
		Total	Illegitimate		Total	Of Illegitimate Children	Total	Legitimate	Illegitimate
City of Manchester		**15,691**	**602**	**3·8**	**3,114**	**279**	**198**	**188**	**463**
I.	Manchester Township	3,926	175	4·5	927	89	236	223	509
II.	North Manchester	4,963	108	2·2	852	41	172	167	380
III.	South Manchester	6,802	319	4·7	1,335	149	196	183	467
I.	Ancoats	1,429	51	3·6	334	31	234	220	608
	Central	711	50	7·0	181	21	255	242	420
	St. George's	1,786	74	4·1	412	37	231	219	500
II.	Cheetham	1,174	17	1·4	146	3	124	124	176
	Crumpsall	216	9	4·2	30	6	139	116	667
	Blackley	218	5	2·3	29	2	133	127	400
	Harpurhey	493	15	3·0	73	4	148	144	267
	Moston	368	7	1·9	52	3	141	136	429
	Newton Heath	1,047	23	2·2	205	8	196	192	348
	Bradford	814	24	3·0	163	11	200	192	458
	Beswick	380	2	5·3	77	1	203	201	500
	Clayton	253	6	2·4	77	3	304	300	500
III.	Ardwick	1,280	49	3·8	240	19	188	180	388
	Openshaw	853	26	3·0	180	8	211	208	308
	Gorton (West)	874	36	4·1	166	20	190	174	556
	Rusholme and Kirk.	634	24	3·8	94	11	148	136	458
	Chorlton-on-Medlock	1,218	89	7·3	224	38	184	165	427
	Hulme	1,943	95	4·9	431	53	222	205	558

TABLE J, 1901.

INFANTILE MORTALITY IN THE CITY, AND ITS THREE MAIN DIVISIONS.

DEATH-RATES UNDER ONE YEAR PER 1,000 BIRTHS.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester
All Causes	198·46	236·12	171·67	196·27
Measles	4·46	5·60	2·22	5·44
Whooping Cough	5·29	6·11	5·64	4·56
Other Com: Infectious Diseases†	0·89	0·25	1·41	0·88
Diarrhœal Diseases	47·54	61·64	42·31	43·22
Tubercular Diseases‡	8·92	10·95	5·04	10·59
Convulsions	10·52	9·42	10·28	11·32
Other Nervous Diseases§	4·01	5·60	4·23	2·94
Lung Diseases	30·27	35·41	32·24	25·87
Wasting Diseases ‖	53·41	64·19	43·72	54·25
Suffocation	0·13	0·51	...	...
Found dead in bed	5·16	7·64	3·22	5·15

† These are Smallpox, Scarlatina, Diphtheria, Membranous Croup, and various forms of "Fever," including the chief forms of Typhus and Typhoid.

‡ These are Phthisis, Tubercular Meningitis (Hydrocephalus), Tabes Mesenterica, and General Tuberculosis (Scrofula).

§ These are Meningitis, and other diseases of the Brain and Spinal Cord.

‖ These are Premature Birth, and such ill-defined causes as Atrophy, Marasmus, Debility, Inanition, &c.

TABLE K, 1901.—CITY OF MANCHESTER. ANNUAL RATES OF MORTALITY PER 1,000 PERSONS LIVING AT ALL AGES, IN THE CITY OF MANCHESTER AND IN ITS STATISTICAL DIVISIONS, FROM CERTAIN DISEASES AND GROUPS OF DISEASES.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester	City of Manchester Average of 10 years 1891-1900
All Causes	21·60	27.52	17·57	21·08	23·10
Smallpox	...	...	...	...	0·01
Measles	0·53	0·58	0·29	0·68	0·76
Scarlet Fever	0·23	0·24	0·25	0·22	0·23
Typhus Fever	0·02	0·07	...	...	0·00
Influenza	0·18	0·17	0·17	0·19	0·29
Whooping Cough	0·41	0·41	0·48	0·36	0·59
Diphtheria, and Memb: Croup	0·24	0·16	0·30	0·25	0·20
Ill-defined Fever	0·00	...	...	0·00	0·01
Enteric Fever	0·14	0·16	0·13	0·13	0·21
Diarrhœal Diseases	1·86	2·72	1·61	1·56	1·42
Puerperal Fever	0·06	0·04	0·07	0·07	0·07
Erysipelas	0·07	0·10	0·06	0·05	0·05
Pyæmia, Septicæmia	0·04	0·03	0·05	0·05	0·02
Phthisis (Tuberc: Pulmon:)	2·09	3·49	1·21	1·93	2·06
Tubercular Meningitis	0·25	0·33	0·13	0·28	0·31
Tuberc: Periton: Tabes Mes:	0·20	0·33	0·10	0·19	0·92
Tuberculous Dis: (other)	0·58	0·48	0·19	0·35	
Alcoholism	0·14	0·19	0·09	0·14	0·12
Cancer	0·78	0·85	0·63	0·84	0·68
Rheumatic Fever	0·09	0·11	0·07	0·10	0·07
Premature Birth	0·61	0·67	0·48	0·67	0·61
Brain and Nervous Diseases	1·22	1·63	1·03	1·13	1·53
Heart Diseases	2·55	2·93	2·21	2·58	2·54
Bronchitis	1·96	2·55	1·64	1·86	2·44
Pneumonia	2·22	2·94	1·64	2·21	2·50
Respiratory Diseases (other)	0·30	0·30	0·30	0·30	0·37
Digestive Organs (Diseases of)	1·00	1·07	0·78	1·12	1·06
Urinary Organs (Diseases of)	0·49	0·64	0·45	0·44	0·50
Old Age	0·38	0·32	0·31	0·46	0·46

TABLE L, 1901.

MANCHESTER.—Certification of the Causes of Death in the Main Divisions and in Districts.

	STATISTICAL DIVISIONS.	Total Deaths	Certified by		Not Certified	Proportion per cent. of Deaths		
						Certified by		Not Certified
			Registered Medical Practitioners	Coroner		Regist'd Medical Prac-titioners	Coroner	
	City of Manchester	**11,801**	**10,755**	**927**	**119**	**91·1**	**7·9**	**1·0**
I.	Manchester Township...	3,716	3,311	349	56	89·1	9·4	1·5
II.	North Manchester	2,938	2,714	203	21	92·4	6·9	0·7
III.	South Manchester	5,147	4,730	375	42	91·9	7·3	0·8
I.	Ancoats	1,275	1,159	103	13	90·9	8·1	1·0
	Central	878	752	106	20	85·6	12·1	2·3
	St. George's	1,563	1,400	140	23	89·5	9·0	1·5
II.	Cheetham	528	491	37	...	93·0	7·0	...
	Crumpsall	142	133	7	2	93·7	4·9	1·4
	Blackley	139	130	9	...	93·5	6·5	...
	Harpurhey	273	256	16	1	93·7	5·9	0·4
	Moston	185	171	13	1	92·4	7·0	0·6
	Newton Heath	712	647	56	9	90·8	7·9	1·3
	Bradford	524	480	38	6	91·6	7·3	1·1
	Beswick	267	250	15	2	93·6	5·6	0·8
	Clayton	168	156	12	...	92·8	7·2	...
III.	Ardwick	865	804	48	13	93·0	5·5	1·5
	Openshaw	552	516	34	2	93·4	6·2	0·4
	Gorton (West)	562	515	43	4	91·6	7·7	0·7
	Rusholme and Kirk. ...	391	356	28	7	91·0	7·2	1·8
	Chorlton-upon-Medlock	1,138	1,029	98	11	90·4	8·6	1·0
	Hulme	1,639	1,510	124	5	92·1	7·6	0·3

TABLE M, 1901.—PARTICULARS AS TO MANCHESTER PATIENTS UNDER TREATMENT IN THE SEVERAL FEVER HOSPITALS DURING THE YEAR; ALSO OF PATIENTS FROM OUTSIDE DISTRICTS SENT TO MONSALL AND CLAYTON DURING THE SAME PERIOD.

DISEASE	HOSPITAL	In Hospital commencement of year	Admitted	Discharged	Died	Remaining in Hospital close of year
SMALLPOX	Clayton Hospital	...	1	1	...	...
	Total	...	1	1	...	...
SCARLET FEVER	Monsall Other Hospitals	403 ...	2,223 ...	2,165 ...	116 ...	345 ...
	Total	403	2,223	2,165	116	345
DIPHTHERIA	Monsall Other Hospitals	10 ...	265 ...	192 ...	63 ...	20 ...
	Total	10	265	192	63	20
ENTERIC FEVER	Monsall Other Hospitals	27 1	211 12	177 4	33 9	28 ...
	Total	28	223	181	42	28
TYPHUS FEVER	Monsall Other Hospitals	1 ...	30 2	25 ...	6 2	... ...
	Total	1	32	25	8	...
OTHER ACUTE DISEASES	Monsall Other Hospitals	30 ...	384 ...	375 ...	25 ...	14 ...
	Total	30	384	375	25	14
ALL DISEASES		472	3,128	2,939	254	407

PATIENTS SENT TO MONSALL, FROM DISTRICTS OUTSIDE THE CITY, DURING THE YEAR 1901.

DISEASE	Withington	Moss Side	Sale	Swinton Schools	Royal Infirmary	Cheadle Convalescent Home	Pendlebury Hospital	Chorlton Union Workhouse	Other Districts
Smallpox	...	...	...	...	...	...	...	...	...
Scarlatina	144	152	50	1	...	2	6	...	...
Diphtheria	12	8	2	...	...	...	...	...	...
Enteric Fever	4	2	2	...	...	...	...	...	...
Other Diseases	7	4	1	5	...	1	...	...	2

Total, 405.

TABLE N, 1901.—WORK OF SANITARY DEPARTMENT FOR THE YEAR.

	TOWNSHIPS																		
	Ancoats	Central	St. George's	Cheetham	Crumpsall	Blackley	Harpurhey	Moston	Newton	Bradford	Beswick	Clayton	Ardwick	Openshaw	Gorton (West)	Rusholme and Kirkmanshulme	Chorlton-upon-Medlock	Hulme	TOTAL
Complaints to Sanitary Superintendent	4,034	1,155	3,264	2,451	358	341	657	717	2,237	1,050	616	11	269	1,684	463	172	793	1,960	22,232
Inspections of Dwelling-houses	5,368	4,915	6,129	7,416	992	464	983	990	2,926	1,977	1,129	546	4,155	2,170	2,051	2,223	4,520	7,463	56,417
Inspections of Newly-infected Dwelling-houses	257	193	362	277	105	13	134	58	233	149	101	77	269	264	178	172	322	480	3,674
Inspections of Cellars	42	5	11	...	3	...	...	...	9	1	...	...	3	...	...	...	40	26	140
Inspections of Schools	5	4	12	5	11	3	4	...	6	...	...	...	3	2	2	12	8	17	94
Inspections of Factories and Workshops	62	271	35	7	11	2	...	1	34	12	...	...	...	21	...	...	32	9	497
Inspections of Lodging-houses	71	84	682	88	1	...	...	...	13	1	2	...	15	5	...	1	13	82	1,058
Inspections of Offensive Trades	63	21	10	9	8	...	1	2	11	3	...	21	121	66	43	16	13	33	441
Inspections of Dairies and Milkshops	72	98	70	304	49	15	27	37	29	14	17	39	97	97	41	97	122	122	1,347
Inspections of Bakehouses	185	450	188	485	5	41	122	17	117	114	62	19	171	152	243	154	534	557	3,616
Inspections of Canal Boats	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,652
Inspections of Slaughter-houses	1	...	...	...	1	...	...	...	...	...	...	2	...	1	9	13	...	5	32
Inspections of Tips for Refuse	...	...	2	...	16	1	5	50	16	...	...	...	...	64	...	1	...	...	155
Inspections of Miscellaneous Inspections	1,366	1,722	898	746	297	157	147	384	974	369	282	572	414	972	346	271	683	1,520	12,120
Inspections of Factories and Workshops by Shop Hours, &c., Inspectors	1,071	6,535	1,210	2,971	22	105	122	20	217	98	83	15	481	266	305	220	1,631	1,397	16,769
Inspections of Shops by Shop Hours, &c., Inspectors	125	1.150	346	495	...	3	104	...	136	81	162	...	175	220	183	282	692	691	4,845
Infected Rooms Fumigated	881	55	1,039	529	188	85	207	151	572	327	91	80	340	883	8	276	146	905	6,869
Infected Dwellings Re-inspected	707	453	1,022	575	292	110	363	133	523	372	177	315	469	238	312	422	668	1.064	8,215
Drains Tested by Water	371	528	388	99	37	72	237	99	399	134	21	11	212	273	172	317	192	189	3,751
Smoke Abatement: Observations made	85	163	80	70	35	12	20	16	145	51	8	53	44	40	14	35	56	79	1,006
Smoke Abatement: Proceedings before Magistrates	18	37	17	8	7	4	1	6	33	...	...	16	3	5	3	1	10	3	172
Food Adulteration: Samples Collected for Analysis	187	166	131	66	8	4	44	45	97	73	53	30	162	104	83	53	187	204	*1,707
Food Adulteration: Proceedings before Magistrates	25	17	9	2	1	...	1	1	5	3	...	...	7	9	...	6	3	6	95
Ashpits reported to Cleansing Department for emptying	6	32	5	14	323	70	93	120	175	48	9	274	...	155	276	151	49	24	1.824
Receptacles reported to Cleansing Department for emptying	71	137	111	864	3	8	60	...	12	28	16	2	70	15	138	29	54	60	1,678
Notices issued for Abatement of Nuisances.	1,164	1,187	1,387	1,720	194	122	246	124	690	193	47	124	803	582	329	550	1,034	1,937	12,433
Letters written for Abatement of Nuisances	94	46	73	132	4	3	8	106	22	3	...	9	13	20	1	24	54	106	614
Reports made to Medical Officer of Health	3,117	2,984	3,150	2,583	339	334	639	593	2,048	1,303	896	874	2,615	1,785	1,762	1,623	3,006	5,586	36,395
Legal proceedings taken	39	29	36	21	1	2	3	4	10	...	...	2	6	5	4	2	8	22	194
Total Nuisances abated	1,038	705	1,338	1,555	167	137	282	144	590	341	82	114	380	623	242	434	847	1,743	10,762
Number of Cottages under Five Rooms	7,435	4,964	9,037	729	522	923	688	367	4,409	2,621	1,285	402	4,552	3,510	3,221	826	3,805	8,167	57,463

* 10 Samples from Outside City.

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